Gas Journal

MAY 13, 1936

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Editorial Notes

The Institution Meeting

We publish in our issue to-day particulars of the arrangements which have been made in regard to the Annual Meeting of The Institution of Gas Engineers, which is to be held in London during the last week in this month. The programme is a varied one calculated to meet with general approval; and there should be satisfaction that the selling as well as the making of gas is to receive proper consideration. Two of the communications to be presented deal with the sales side. One is by Mr. J. T. Haynes, formerly Engineer and General Manager to the Rotherham Gas Department. Mr. Haynes, while he was at Rotherham, showed himself to be an enthusiast on the question of promotional tariffs and commendably enterprising in putting his ideas into practice. His Paper on "The Two-Part Tariff as an Aid to Gas Sales"—a subject as topical now as when he introduced such a tariff at Rotherham—will prove popular; and Mr. Haynes has the happy knack of provoking discussion.

The other sales Paper is by Mr. T. H. Pardoe, Chief Industrial Gas Sales Engineer to the Stretford and District Gas Board, who will deal with heating problems arising in industrial gas sales. In view of the success achieved at Stretford in building up a large industrial load covering a wide range of uses, this communication is likely to prove particularly helpful. On a highly important aspect of gas service we have Mr. C. A. Masterman's Paper on "Gas Safety Precautions"—surely a topic which lends itself to lively discussion. Again, with amalgamation and grouping so very much to the forefront the Paper by Mr. F. C. Briggs on "The Dudley Gas Amalgamation" cannot fail to appeal.

The engineer *qua* engineer is catered for in the Paper on the new gas-works at Shanghai, to be presented by Mr. W. J. Baker, Engineer-in-Chief and Manager to the Shanghai Gas Company; while the fuel technologist will be especially attracted by the joint Paper on "Products obtained by the Carbonization of Scottish Cannel in Continuous Vertical Retorts," by Mr. James Jamieson and Dr. J. G. King. We know that, in collaboration with the Fuel Research Board, Mr. Jamieson has done quite a lot of experimental work; and we look forward to the findings with the liveliest interest.

Amendments to By-Laws

Then, at the afternoon session on the first day of the meeting there is to be a discussion by corporate members of amendments to the by-laws governing admittance to the Institution. Reference to this most controversial matter was made by Colonel Carr at the last Autumn Research Meeting, when he explained that the Executive Committee of the Council quite appreciates that there are many technical workers who are contributing to the work of the Institution and would be most desirable members, yet with the present Constitution are ineligible. Again, in March last, he mentioned another circumstance—that universities other than Leeds University are conducting work in connection with fuel technology where students could take a degree which might be equivalent to the Leeds degree. Provided other conditions were satisfied, such graduates should be able to obtain admission to corporate membership. We hope that the outcome of the discussion on May 26 will be to ensure a far greater measure of satisfaction than exists to-day with the by-laws for admission to corporate membership of the Institution, which debar so many technical workers whose help is of the utmost importance to the progress and prosperity of our Industry. The discussion, by the way, is to be held *in camera*.

As for the visits, these should prove extremely interesting, and the organizing genius of Mr. Alexander is certain to ensure all possible comfort for those participating. The visit to Cadby Hall and the Greenford Works of Messrs. J. Lyons & Co., who are such enormous consumers of gas, will be welcomed. The visit to the Corby Works of Messrs. Stewarts & Lloyds, Ltd., is one of the most ambitious half-day trips ever undertaken, involving special trains. Another visit is to the Neasden Works of Ascot Gas Water Heaters, Ltd. The Friday visit—to Portsmouth and the Isle of Wight—is another ambitious project, involving not only special trains but also special steamers. On this occasion the Institution is to enjoy the hospitality of the Portsmouth Gas Company at luncheon and be entertained at tea by the Ryde Gaslight Company. This year the Reception and Dance is to be held on the Wednesday instead of the customary Tuesday, and the venue is Grosvenor House, which has the largest

ballroom floor in London. Any additional accommodation thus secured will be very generally welcomed.

Everything considered, this year's Institution Meeting bids fair to be a huge success. We may, however, call the attention of Mr. Alexander—should the matter have escaped his notice—to an enlivening item introduced into Gas Association Conventions in America. The average gas man in the States, it is maintained, likes his educational pills in sugar coating, for which reason a novelty by way of a "flash radio stunt" was introduced at a recent meeting of a Gas Association at Boston. After each speaker finished his Paper, a voice boomed through a concealed loud speaker and flashed news and "wisecracks" through the convention hall. The anonymous speaker was stationed at a microphone in an adjoining room. Commenting on this innovation, the *Gas Age-Record* said: "We urge programme committees to dramatize at least one part of their meetings. Increased attendance and more active participation will reward such efforts." The idea has its attractions. If Mr. Alexander secured the services of, say, Mr. George Robey as the "wisecracker" we should doubtless be able to record after the meeting that "the attendances were excellent throughout."

Retirement of Mr. W. E. Price

THE Meeting this year cannot but close, however, without a tinge of sadness. We refer to the retirement of Mr. W. E. Price from the office of Hon. Secretary of the Institution. Mr. Price has held this office for no fewer than twenty-two years—a period which has witnessed grave difficulties and also great developments in our Industry. Throughout Mr. Price has rendered outstanding service to the Institution in particular and the Industry in general. He has carried out his work modestly and graciously and has endeared himself to all. The platform at future meetings of the Institution will indeed be strange without the familiar presence of Mr. Price on the left of the President. At the opening session of the meeting on May 26 he will be presented with an Address expressing the gratitude of all members for his untiring services; and the Council, as a tribute to one possessing such widespread affection, has inaugurated a W. E. Price Presentation Fund. It is typical of the recipient—and it is a matter which needs no enlargement on our part—that the proceeds are to be devoted to the Benevolent Fund of the Institution. Our readers will, we know, join with us in an expression of sincere thanks for all he has done and of equally sincere hope that for long he will enjoy happiness in his retirement in the full knowledge that he carries into it a measure of appreciation which falls to the lot of few.

Two Bills Advance

THE Gas Light and Coke Company (No. 2) Bill and the York Gas Company Bill—two measures to which the Industry quite rightly attaches great importance—have made progress in the past week. The Gas Light Bill was considered on four days by a Committee of the House of Commons. While we publish a full report of the proceedings elsewhere, we naturally refrain from comment on a matter that is still under the consideration of Parliament. It is satisfactory to be able to report that the Committee decided in favour of the general principle embodied in the Bill, and few could have failed to be impressed by the evidence offered by women tenants who gave convincing testimony of their desire to use gas.

This week it is the turn of the York Gas Company, and, as we go to press, the Bill which that Company is promoting is in its Committee stage. This Bill is, of course, similar to the Gas Light and Coke Company Bill, for in York there has been the same refusal by the Corporation to concede to the Gas Company the right enjoyed by the Electricity Department of carcassing Council houses during their erection. Once again women tenants, who incidentally have faced the inconvenience of travelling up to London for the purpose, have given striking evidence of the popularity of gas among the working classes. The decision of the Committee on this Bill will be awaited with interest.

A New Coal Bill

THE introduction of a Coal Mines Bill in the House of Commons last week will ensure that the attention of Parliament is once again directed to the essential though troubled coal industry. In dealing with this measure it is greatly to be hoped that the voices of Members of Parliament other than those who are primarily "coal Members" may be heard, for it is impossible to deal with the vital basic industry of coal without having due regard to the many other industries of the country which depend upon coal for their existence.

The primary object of the new Bill is to strengthen the powers of the Coal Mines Re-organization Commission which was set up under the Coal Mines Act, 1930, for the purpose of furthering the re-organization of the coal industry and promoting and assisting the amalgamation of undertakings where such amalgamations appeared to be in the national interest. The work of the Commission, it will be remembered, received a serious check last year by reason of the judgment of the Court of Railway and Canal Commission in which that Court refused to confirm a scheme for the partial amalgamation of coal mines in the West Yorkshire District, on the ground that it was not satisfied that the scheme was in the national interest. The Bill therefore proposes to confer greater powers upon the Commission, and to place upon it a duty to make schemes of amalgamation for submission to the Board of Trade.

From the point of view of the Gas Industry, and indeed of all Public Utilities, the vital provision of the Bill is that contained in Section 9, which proposes to continue Part I. of the Coal Mines Act, 1930, until the end of 1942. We need hardly remind our readers that Part I. of the Act in question contains the provisions which permit the making of Coal Schemes under which the system of quotas and minimum prices has been initiated. As the law stands to-day these provisions would have expired in 1937, but it is now proposed to extend their life for another five years.

It could not be denied that the operation of Coal Schemes has borne heavily upon the Gas Industry, and indirectly upon the vast population of the country which uses gas for its essential domestic requirements. It is to be feared that the results of the system are to be felt even more severely in the future, particularly if centralized buying and selling (which is now in operation in the Lancashire and Cheshire area) is extended to the country as a whole. The sale of coal will become a monopoly in the hands of the coal owners, organized as a unified selling and buying agency which has statutory authority to discriminate between one class of user and another. It goes without saying that where monopolistic powers of this kind covering the life blood of British industry are given, adequate protection should be afforded to the consumer.

At present the only remedy available to the consumer is to appeal to one of the Committees of Investigation. These Committees are not, however, judicial bodies; they consist of a chairman who may have been appointed for political reasons; two representatives of the coal industry (owners and workers); and two representatives of the consumers. It is in our view essential that a right should be given of appeal to a Tribunal which possesses

the confidence of the consumer and is endowed with adequate powers to obtain evidence and to enforce its awards. Such a Tribunal should obviously be of a judicial character, and its members should be concerned not to represent interests, but to administer justice.

The feelings of the Gas Industry on the whole subject were forcefully voiced at an Edinburgh luncheon, shortly before the appearance of the new Bill, by one who is recognized as one of its most broad-minded representatives, Councillor Walter Muter, Convener of the Edinburgh Corporation Gas Committee. Reference to his remarks is made in our news columns to-day.

Reconstruction at Lincoln

THE Presidential Address given last week to the Eastern Counties Gas Managers' Association by Mr. George Wright, Engineer and Manager of the Lincoln Gas Department, is a modest account of what is in reality a noteworthy achievement over a short period of years. Mr. Wright was appointed to the position at Lincoln in 1930, and since that time the undertaking has been quite transformed. New storage capacity has been installed, the works have been entirely reconstructed, a new gas distribution centre has been built up, and modern selling methods have been adopted. That, in outline, is what Mr. Wright details in his Address, from which it will be gathered that the task he has so well accomplished has been no light one. The result of all this work has been to place the Department in a secure position to withstand competition and largely to extend its activities. Mr. Wright has good reason to be proud of an exceedingly well laid out works modern in every detail, and it may be mentioned that the reconstruction scheme resulted in a saving in working expenses of over £16,000 a year and allowed of a reduction in the price of gas.

The Lincoln Gas-Works is indeed a show place. What was a largely out-of-date works has been converted into one with up-to-date and extremely efficient equipment which has given strong practical proof of its economic worth. It is characterized by buildings of good design conveniently grouped round well-laid open yards. The exhauster house is airy, well-lighted, and pleasingly finished. Mr. Wright, too, rounded off his scheme with a most attractively planned garden, in which beautiful beds of flowers and flowering shrubs, rockeries, and grass bordered paths are grouped around a fine sunken rose garden. It is entirely home produced, for the terraces and walls, the paving of the sunken garden, and the well-stocked rockeries are built up with the materials from the dismantled horizontal retort beds and concrete foundations. Mr. Wright found an excellent use for materials which he would otherwise have been compelled to have carted away at considerable expense; and the labour of constructing the garden and keeping it in order has provided occupation for old employees of the Department. We have dealt at some length with the appearance of the Lincoln Gas-Works, for we believe that it has a most important value in the effect on the minds of the employees. An attractive works is an encouragement to those in it to keep it clean and tidy; it makes for all-round efficiency.

The new equipment, too, has had an important effect on municipal opinion in the City. It has altered the outlook of those who were gaining the absurd idea that the prospects of gas were waning; trepidation has given place to confidence, and the Department is going ahead by leaps and bounds. Neighbouring villages, some of them already supplied with electricity by the Grid, are welcoming a gas supply with open arms. Domestic consumers are taking advantage of the facilities for acquiring enamel cookers with thermostatic control; and in the near future the Lincoln Gas Department will be in the position of not having a black cooker on the district. Industrialists in the district have been convinced of the merits of gaseous fuel and are converting their plants to gas firing. During the past twelve months the increase in the industrial load amounted to over 11%. To obtain a perspective of the position, Mr. Wright issued a questionnaire to the various firms using gas, asking them to try to forecast their approximate future requirements, and the replies indicated that in the next two years the industrial load will be equivalent to half the present total output of the Department—*i.e.*, 300 million cu.ft. And this applies only to firms which have been converted to date.

Beating the Grid

VISITORS to Lincoln cannot fail to be struck by the amount of attention that is devoted there to the important subjects of heat and light, which may be taken as roughly symbolizing the industrial and residential aspects of the city. The commodities of both the Gas Department and the Electricity Department are widely and prominently advertised, and each has adopted a live progressive policy, which means that the citizens are well served. The resourcefulness of Mr. Wright was thoroughly appreciated last week, and we may be pardoned for reproducing here one interesting little example of his keenness. In connection with a certain village to which a gas main was to be laid, the electricity suppliers concentrated on beating them with the grid; but without wasting any time, Mr. Wright canvassed the villagers and proceeded to get in services all over the place, before he had actually put in the main. In other words, he started the job at the extreme ends, and finished it in the middle. The result was that he secured practically every house in the village as a gas consumer.

This was by no means an ordinary method of procedure, but it attained the desired end in a more thorough manner than could have been hoped for had any other means been employed. It is the sort of spirit of which this example is indicative that makes of particular undertakings stars in the firmament of the Gas Industry. The benefits of such enterprise as the Lincoln Gas Department in many ways shows extend far beyond the limits of its own area of supply.

No "Ghost" Lighting

IT was a curious coincidence that on the very day of the meeting of the Eastern Counties Gas Managers' Association in Lincoln, the local Press should have come out with a report headed "No 'Ghost' Lighting for Centre of City." This, of course, does not refer to the genial and well-diffused illumination provided by gas, but to the particularly irritating and garish system of lighting by electricity which is now to be seen in certain districts around the Metropolis.

It seems that a proposal by the City Electrical Engineer to experiment with mercury vapour lamp lighting in certain main thoroughfares of Lincoln had been turned-down by the Highways Committee, though the idea of an experiment with this form of street lighting in some other part of the city has not been finally rejected. If it must take place, it is comforting at least to reflect that it is unlikely to be provided with an opportunity of marring the ancient beauties of so fine a city. Quoth one Alderman: "We do not think it is a good thing to see everybody walking about in the centre of the city looking bilious and green." But he added: "We must be prepared to experiment elsewhere"—presumably, where it

will not matter how bilious and green people may look. We wonder whether the Committee have had any suggestions?

Our own observations led us to the opinion that there are points at which improved lighting would be an advantage—or shall we say increased lighting?—but nothing is required that gas cannot perfectly well accomplish, at moderate cost, and without making a single ratepayer either feel or look bilious and green. Would that some councillors nearer home could see the mercury vapour lamp as others see it!

The Oil Industry

THE Society of British Gas Industries were fortunate in persuading Sir John Cadman to serve as President for two years in succession. It will be recalled that in his Address last year he urged greater co-operation within our Industry, emphasizing the need for a strong and a united voice. His Address to the Society at the Annual Meeting to-day—it is published on later pages—is a history in brief of the growth of the oil industry, starting with the enterprise of James Young in Derbyshire and concluding with a reference to the efforts at present being made to discover petroleum in the United Kingdom. The geologists of the Anglo-Iranian Oil Company have come to the conclusion that there are reasonable prospects of oil existing in rocks of earlier ages; and the test well now being drilled near Portsmouth, says Sir John, is the result of very careful piecing together of a large volume of geological evidence, the result of which would certainly cause investigations to be made in any other country if the same evidence was forthcoming. In the "JOURNAL" last week we speculated on what the effect might be on the Gas Industry of the possible discovery of a petroleum field in this country, but we did not suggest that the Industry should as yet suspend development on present lines on the strength of any probability.

Perhaps the most interesting section of Sir John Cadman's Presidential Address is the account of the laying of the Iraq pipeline, almost the entire route of which lies in desert wastes. The pipeline has an aggregate length of 1,150 miles and is constructed of steel tubes jointed by welding. The cost of this engineering enterprise, in the carrying-out of which all kinds of difficulties were encountered, was a matter of £10,000,000, and some 22 million ton-miles of transport were involved. Transport of the material alone was a tremendous task. The pipeline is buried throughout its length and, to provide for expansion and contraction, it is laid under compression. "After the completion of operations a slight disturbance of the ground marked the route of the pipeline. So far as the eye could see, there stretched an apparently interminable row of telegraph posts, running without deviation from horizon to horizon. Between the posts copper wires glinted in the sun. Elsewhere the desert remained unaffected and untouched. Nevertheless the passage of modern industry has left its mark."

Institution of Gas Engineers

Programme of the 73rd Annual General Meeting, May 26-29

President: Colonel WILLIAM MONCRIEFF CARR, O.B.E., T.D.

TUESDAY, MAY 26.

10. 0 a.m. Opening of the 73rd Annual General Meeting in the Great Hall of the Institution of Civil Engineers, Great George Street, London, S.W. 1.
Welcome to Representatives from Overseas.
Adoption of the 73rd Annual Report and Accounts, 1935-36.
Presentation of Medals.
Presentation of Address to the retiring Hon. Secretary, Mr. W. E. Price.
Presidential Address by Colonel W. Moncrieff Carr.

11. 0 a.m. to 12 noon. Paper on "The Dudley Gas Amalgamation," by Francis C. Briggs, Engineer and Managing Director, Dudley, Brierley Hill, and District Gas Company.

12.15 p.m. Photograph on the Horse Guards Parade, St. James' Park.

12.45 p.m. President's Luncheon in the Ballroom of the Savoy Hotel, Victoria Embankment.

3. 0 p.m. Paper on "The Two-Part Tariff as an Aid to Gas Sales," by John T. Haynes, formerly Engineer and General Manager Rotherham Corporation Gas Department.

4. 0 p.m. to 4.55 p.m. Discussion by Corporate Members in private of the Proposed Amendment of the By-Laws Governing Admittance to the Institution.

4.55 p.m. to 5. 0 p.m. Scrutineers' Reports of the Ballots.

WEDNESDAY, MAY 27.

10. 0 a.m. Paper on "Heating Problems Arising in Industrial Gas Sales," by T. H. Pardoe, Chief Industrial Gas Sales Engineer, Stretford and District Gas Board.

11. 0 a.m. General Meeting of the Benevolent Fund of The Institution of Gas Engineers.

11.15 a.m. to 12.15 p.m. Paper on "Gas Safety Precautions," by C. A. Masterman, Chief Technical Officer, Gas Light and Coke Company.

12.45 p.m. Council Luncheon to the President at Grosvenor House, Park Lane.

2. 0 p.m. to 5.30 p.m. Visit by Motor Coach to J. Lyons & Co., Ltd., at Cadby Hall, Kensington. Ladies may participate.

2. 0 p.m. to 6.15 p.m. Visit by Motor Coach to J. Lyons & Co., Ltd., at Greenford Works, Middlesex. Ladies may participate.

9. 0 p.m. to 2. 0 a.m. Reception and Dance in the Great Room of Grosvenor House, Park Lane.

THURSDAY, MAY 28.

10. 0 a.m. Paper on "Products obtained by the Carbonization of Scottish Cannel in Continuous Vertical Retorts," by James Jamieson, Engineer and Manager, City of Edinburgh Gas Department, and J. G. King, Chief Chemist, Fuel Research Station, Department of Scientific and Industrial Research.

11. 0 a.m. Paper on "The New Gas-Works at Shanghai," by W. J. Baker, Engineer-in-Chief and Manager, Shanghai Gas Company, Ltd.

11.15 a.m. to 11.30 a.m. Concluding Business of Meeting.

12.28 p.m. to 8. 0 p.m. Visit by special train (on which luncheon and dinner will be served) to the Corby Works of Stewarts & Lloyds, Ltd., where the Coke Ovens, Bessemer Plant, Rolling Mills, Tube Works, and Blast Furnaces will be inspected. Ladies' participation cannot be arranged.

2. 0 p.m. to 6.15 p.m. Visit by motor coach to the Neasden Works of Ascot Gas Water Heaters, Ltd. Ladies' participation cannot be arranged.

2. 0 p.m. to 6.15 p.m. Ladies' Visit to H.M. Tower of London. Members may participate.

FRIDAY, MAY 29.

VISIT TO PORTSMOUTH AND THE ISLE OF WIGHT.

Waterloo—Portsmouth and Southsea—Isle of Wight (Ryde—Sandown—Shanklin—Ryde)—Waterloo.

Morning: Waterloo Station (9.19 a.m.) by special train to Portsmouth and Southsea Station (11.5 a.m.).
Portsmouth and Southsea Station by Motor Coach to H.M. Dockyard to visit H.M.S. "Victory," and to the Offices and Showrooms of the Portsmouth and Gosport Gas Company (11.10 a.m. to 12.30 p.m.).
Luncheon, by invitation of the Chairman and Directors of the Portsmouth and Gosport Gas Company, at the Guildhall (12.45 to 2.0 p.m.).

Afternoon: Portsmouth Harbour (2.25 p.m.) by special steamer to Ryde.
Tea, by invitation of the Chairman and Directors of the Ryde Gaslight Company, in the Eastern Pavilion, Ryde (3.15 p.m.).
Ryde (3.45 p.m.) by motor coach to Sandown and Shanklin Chine, returning to Ryde (5.15 p.m.).

Evening: Ryde (5.30 p.m.) by special steamer to Portsmouth Harbour.
Portsmouth Harbour Station (6.15 p.m.) by special train (on which supper will be served) to Waterloo Station (8.12 p.m.).
Ladies may participate.

Personal

The marriage was celebrated on April 30, 1936, at All Saints', Ennismore Gardens, quietly, of Col. WILLIAM REID GLOVER, C.M.G., D.S.O., T.D., elder son of the late R. T. Glover and Mrs. Glover, to May Shephard, widow of Lt.-Comdr. Hardinge Shephard, R.N., and daughter of the late John Waghorn and Mrs. Waghorn.

* * *

Mr. R. F. SIMPSON has been appointed Publicity Officer of the Sheffield Gas Company. He has had many years' experience in advertising and sales promotion, and was previously with Allied Newspapers, Ltd., and two large National Advertisers. Mr. Ralph Halkett, General Manager and Secretary of the Company, informs us that this appointment became necessary because of the continued growth of Sheffield Gas propaganda, and that plans are in hand for a still more vigorous use of this necessary aid to bigger sales.

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We are informed that Mr. BENJAMIN THORPE, M.Inst.Gas E., at present Chief Chemist and Deputy Works Superintendent of the Huddersfield Corporation Gas Department, has been appointed to the position of Assistant Superintendent of the Grimesthorpe Works of the Sheffield Gas Company.

* * *

Mr. A. C. REA, A.M.I.Mech.E., Technical Assistant to the Edinburgh Corporation Gas Department, has been appointed Assistant Engineer to the Perth Gas Department. Mr. Rea was educated at Craiglockhart Public School, Boroughmuir Higher Grade School, and Heriot-Watt College, Edinburgh. Before entering the Gas Industry in 1927, he served an engineering apprenticeship with the West End Engine Works Company, Edinburgh, later entering their drawing office as junior draughtsman. He has been engaged in both the manufacturing and distribution departments of the Edinburgh Gas Department, gaining his experience under Mr. H. H. Gracie and later under Mr. J. Jamieson. In 1925 he was awarded the Higher National Diploma and the Heriot-Watt Diploma in Mechanical Engineering, being elected a Graduate of the Institution of Mechanical Engineers and an Associate of the Heriot-Watt College. In 1931 he was successful in obtaining a 1st Class Diploma in Gas Engineering (Manufacture) with the Charles Hunt Memorial Medal, later being elected an Associate Member of both the Institutions of Mechanical and Gas Engineers. For the past three years Mr. Rea has been Hon. Secretary and Treasurer of the Scottish Junior Gas Association (Eastern District). He takes up his new duties on May 18.

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Mr. ADAM C. FINNIE, Assistant Manager at the Crieff Gas-Works, has received an appointment as Manager of the Gas-Works at Duns in Berwickshire. Mr. Finnie went to Crieff from Leven about nine years ago. The appointment was rendered necessary by the retirement of Mr. F. Welsh.

* * *

Mr. S. NEAL, who has been for 51 years in the service of the Bury Corporation and held the position of Chief Clerk in the Gas Department, has retired on superannuation.

Obituary

The death occurred in Edinburgh on May 4 at the age of 32, of Mrs. BELLE BAIN WADDELL, wife of Mr. Marshall A. Waddell, Engineer and Manager of the South Queensferry Gas Company, Ltd.

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The death took place on Friday, May 8, of Mr. DAVID P. TODD, aged 75, who, for a long number of years, was Secretary of the Lasswade and Bonnyrigg Gas Company.

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We are informed by Messrs. E. Pass & Co., Denton, of the death on May 8 of their Principal, Mr. EDWIN PASS, following a period of illness which lasted for many months.

* * *

The death has occurred at Guildford at the age of 91 of Mr. WILLIAM STEVENS, who was for over 40 years a Director of the Guildford Gas Company and for some years Vice-Chairman. Mr. Stevens was associated with several public bodies in the borough, of which he was a native, and in his early years was a noted cricketer.

Correspondence

W. E. Price Presentation Fund

SIR,—Your readers will learn with regret that Mr. W. E. Price has resigned the Honorary Secretaryship of The Institution of Gas Engineers as from the termination of the 73rd Annual General Meeting on May 28.

Mr. Price will then have been in office for 22 years, during which difficult and rapidly developing period he has rendered outstanding service to the Gas Industry in general and the Institution in particular.

The Council, to mark such service and as a tribute to one possessing the affection of all, has inaugurated the *W. E. Price Presentation Fund*, the proceeds of which will, at the request of Mr. Price, be devoted to the Benevolent Fund of The Institution of Gas Engineers, now in its Diamond Jubilee Year.

An Address, expressing gratitude for the work of Mr. Price, will be presented to him at the 73rd Annual General Meeting.

Contributions to the Fund should be sent, if possible before May 22, to me as Honorary Treasurer and Secretary of the Fund.

Yours, &c.,
J. R. W. ALEXANDER,
Secretary.

Institution of Gas Engineers,
28, Grosvenor Gardens,
London, S.W. 1,
May 8, 1936.

Forthcoming Engagements

May.

19.—I.G.E.—Gas Education Executive Committee, 2.30 p.m.

20.—B.C.G.A.—Executive Committee Meeting, 11.30 a.m.; General Committee Meeting, 2.30 p.m.

21.—WALES AND MONMOUTHSHIRE ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—General Meeting at Monmouth.

26.—W.G.C.—Annual General Meeting at Londonderry House, Park Lane, W. 1, at 3.30 p.m.

26-29.—I.G.E.—Annual General Meeting.

June.

8.—I.G.E.—Finance Committee, 1.45 p.m.; Membership Committee, 2.15 p.m.; General Purposes Committee, 3 p.m.

9.—I.G.E.—Council Meeting, 10 a.m.

10.—ASSOCIATION OF STATUTORY INSPECTORS OF GAS METERS.—17th Annual General Meeting, County Hall, Westminster, 10.15 a.m.

16.—I.G.E.—Gas Education Executive Committee, 2.30 p.m.

18.—I.G.E.—Refractory Materials Joint Committee (Stoke-on-Trent), 2.30 p.m.

19.—WAVERLEY ASSOCIATION OF GAS MANAGERS.—Annual Meeting at Edinburgh.

23.—I.G.E.—Gas Education Consultative Committee, 2.30 p.m.

24.—I.G.E.—Board of Examiners (Oral Examinations), 9.30 a.m.

30.—SOUTHERN ASSOCIATION.—Annual Summer Meeting.

July.

2.—I.G.E.—Joint Research Committee at 2.30 p.m.

3.—MANCHESTER DISTRICT ASSOCIATION.—Manchester Meeting.

8-10.—CANADIAN GAS ASSOCIATION AND NORTH-WEST CONFERENCE PACIFIC COAST GAS ASSOCIATION.—29th Annual Convention, Vancouver.

24.—SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS (EASTERN DISTRICT).—County Meeting at Swindon.

Sept.

10.—NORTH BRITISH ASSOCIATION.—Annual Meeting at Kirkintilloch.

News in Brief

Applications are Invited for the post of Senior Technical Assistant Engineer to the Sheffield Gas Company at a commencing salary of £800 per annum. Further particulars will be found in our advertisement columns.

A Gas Home Service Exhibition and Cookery Demonstrations promoted by the Manchester Gas Department at the Public Hall, Dickenson Road, Rusholme, Manchester, last week, was opened by Ambrose, the noted dance band leader.

An Increase in the Price of Gas has been approved by the North Berwick Town Council, who have raised the price of gas by 2½d. per 1,000 cu.ft. as from this month's reading. This advance has been rendered necessary owing to the higher price of coal.

Copies of the Recent B.S. Specification for Flexible Metallic Tubing and Connectors for Portable Gas Appliances can be purchased, price 2s. each, from the Secretary, The Institution of Gas Engineers, 28, Grosvenor Gardens, S.W. 1. We referred to this specification in our issues for April 29 and May 6.

For Reconstruction and the provision of continuous vertical retorts the Prestatyn Urban District Council proposes to borrow £12,012. Since 1926 there has been a steady increase in the consumption of gas and also an increase in the population. In view of this, the present gas undertaking is not capable of dealing with the probable demand for gas.

The Winner of a recent competition organized by one of the big National newspapers for recipes using bananas was won by Mrs. Morton, wife of the District Superintendent of the Godalming Gas Company. The prize-winning recipes were cooked by gas, and subsequently judged by Miss Mabel Constanduros and Miss Underhill, at the Radiation Demonstration Kitchens, London.

The Tenders for the £20,000 of 4% perpetual debenture stock which Messrs. A. & W. Richards offered on behalf of the Directors of the Bedford District Gas Company were opened on May 5. They amounted to a total of £48,655 at prices ranging from £109 down to the minimum of £103 per £100 of stock. The lowest accepted tender was at £105, the average price obtained being £105 2s. 8d.

The Blind Cook has been greatly helped by Radiation Ltd., who, in response to many requests, are now able to offer "New World" cookers on which the "Regulo" oven-heat control marks are in the raised Braille characters. Blind persons, or those with very poor sight who have learnt Braille, will therefore be able to use the "Regulo" without the least difficulty or uncertainty.

A Very Successful Series of gas cookery demonstrations under the auspices of the Hereford Gas Department were concluded on Friday, May 8, when 125 ladies attended. The prizes for the successful entrants of the cake competition were presented by Mr. F. Cuddon (Vice-Chairman of the Gas Committee), who was introduced to the audience by Mr. Arthur Roberts, Engineer and Manager to the Department.

Among the Objects of a Special Order for which the Newport (Mon.) Gas Company intend applying to the Board of Trade under the Gas Undertakings Acts, 1920 to 1934, are: To empower the Company to purchase and take by agreement from the coke ovens of the British Benzole and Coal Distillation Company, Ltd., at Bedwas, a bulk supply of gas, and to extend the limits within which the Company are authorized to sell gas.

The Adoption of the 40-hour Week, according to a report recently presented to the City Council, would mean that the Manchester Corporation Gas Department would have to employ 269 additional hands and incur a total annual additional expenditure of £51,896. The Establishment Committee comments: "The effect of the increased cost of the price of gas would be 1·93d. per 1,000 cu.ft. sold. In addition, there would be a capital expenditure of £280 for plant and tools."

At the Recent Cookery Demonstrations arranged by the Ryde Gaslight Company in the Oddfellow's Hall, High Street, upwards of 250 people attended every day, filling all the available accommodation. The Lecturess was Miss E. Sanderson, of the Radiation Research Kitchen, and a cake baking competition was arranged and proved very popular, 90 entries being received. The Gas Company introduced a novel attraction by distributing free to the audience at the conclusion of each demonstration all the good items cooked during the sessions.

Over 200 Gas Lamps are to be erected by the Middlesbrough Corporation Gas Department on new estates. The work will be undertaken gradually as the estates are developed.

For the Position of Secretary and Executive Officer of the National Gas Organizations in Scotland, applications are being invited. Full particulars will be found in our advertisement columns.

Negotiations for the Purchase of the Clarence Gas-Works of Messrs. Dorman Long & Co., Ltd., are shortly to proceed, for the Stockton Town Council has agreed to a recommendation from the Lighting and Power Committee to this effect. At a meeting of the Council, Mr. A. Ross, supporting the proposal, said they were obtaining the right to supply the largest industrial area in the district, and he considered they would be ill-advised to refer the matter back, as had been suggested.

A Successful Fortnight of gas exhibition and cookery demonstrations has just been completed by the St. Austell Gas Company. The first week was run in conjunction with the Parkinson Stove Company, Ltd., and the second with John Wright & Co., Ltd., the demonstrators being Miss Barbara Cobb and Miss Joan Baker respectively. Calor Gas and Ascot Gas Water Heaters formed an interesting part of the exhibits, while washing demonstrations were given by Miss H. Curle, of W. H. Dean & Co., Ltd.

A Motor Omnibus Running on Gas will make its trial trip at Wallasey on Friday, May 29, and will go into commission on the New Ferry route. The 'bus, of the double-deck type, is being "converted" by the staff of the Wallasey Corporation Gas Department. According to a report presented to the Town Council recently, the charges for compressed coal gas, of which 280 cu.ft. are equal in work to one gallon of petrol, should be in the nature of 1s. 10d. per 1,000 cu.ft. On that basis the equivalent charge for petrol would have to be less than 6½d. per gallon.

Warrington Forges Ahead

Loan Application Enquiry

Mr. G. Ewart Rhodes, Engineering Inspector to the Ministry of Health, conducted an enquiry at Warrington last week into the Corporation's application to borrow £54,418 for the erection of additional vertical retorts, and for the replacement of the existing No. 6 gasholder at the Works at Longford.

The Town Clerk said the Corporation had set out to secure a large industrial load. It was felt that to make the Gas Undertaking more successful, it was necessary to encourage and concentrate on the business and industrial load. Since a new scale of charges of 1s. 2d. per 1,000 cu.ft. was instituted, the output of the Works had increased very considerably. For 1931 the output was 701 million cu.ft., and for 1936, 878 million cu.ft.

There was definite knowledge that large consumers would be increasing their requirements and were putting down more furnaces, which would bring the output over the 900 million mark for the year 1936-37, and by the normal rate of increase the output would be more than 1,000 million cu.ft. in the next two years.

There were at present 28 vertical retorts, having a normal capacity of 2,750,000 cu.ft. per day. They had produced up to 3 million cu.ft. per day, but it was not wise to work the retorts in an excessive manner, and their "life" suffered. The figure had actually gone as high as 3,600,000 cu.ft. per day.

World Power Conference

Annual Report, 1935

Prepared by the Central Office of the World Power Conference, 36, Kingsway, London, W.C. 2, the Annual Report for 1935 records the death in May of last year of Mr. D. N. Dunlop, O.B.E., the Chairman of the International Executive Council and of the British National Committee since their foundation. The vacancy caused by the death of Mr. Dunlop was filled by the unanimous election of Sir Harold Hartley, C.B.E., F.R.S., the new Chairman of the British National Committee.

Preparations have proceeded for the holding of the

Chemical Engineering Congress in the Central Hall, Westminster, between June 22 and 27, 1936. Approximately 125 Papers from fifteen countries have been accepted. The British Government has invited each foreign Government to be represented at the Congress by two Official Delegates.

The Third World Power Conference will be held in Washington between Sept. 7 and 12, 1936, by invitation of the American Government. The subject-matter will be the National Power Economy.

A Report on "Standardization: International and National" will be placed on sale shortly.

Coal and the Gas Industry

Councillor Walter Muter Demands Justice

At a luncheon given by the Edinburgh Corporation Gas Department on May 1 in connection with the opening of new benzole plant (an illustrated description of which appeared in last week's "JOURNAL"), at which the Lord Advocate, after starting up the plant, was the principal guest, Councillor Walter Muter, Convener of the Committee, made some extremely appropriate comments on the subject of the coal situation.

The Gas Industry, he said, carbonized about 19 million tons of coal per annum, and they had recently, on the advice of the Government, willingly contributed, as they hoped, towards the prosperity of the coal industry by paying more for their coal. The National Gas Council had advised a contribution of 1s. per ton, but actually an increase of 2s. 6d. and 3s. per ton was being paid by many undertakings for long-dated contracts. The coal industry of this country must set its house in order; they could not come time and again and ask for large contributions towards restoring prosperity in their affairs. They must, just as we had to do in post-war days, address themselves to the problems that confront every industry and place their business upon a solvent and economic basis in such a way as to remove the fear of stoppages in the coalfields.

Regarding the central selling agencies which were to be set up in the coal industry in July, he would say to the Minister of Mines that these agencies would prove to be entirely unsatisfactory unless there was just representation of the large consumers and public utilities such as the gas and electricity undertakings. There must be some organization by which they, the Gas Industry, could be allowed to sit down at the same table as the coal merchants of this country so that a fair and economic price might be arrived at.

All-Rubber Joint for Gas Mains

An Interesting Development

In the "JOURNAL" for Feb. 27, 1935, reference was made to an all-rubber joint for gas mains invented by Mr. A. S. Baxendale, Kiln Corner, Hythe. Since that time the joint has undergone considerable development. It consists of a circular rubber sleeve with a flanged rib. The sleeve may be considered a horizontal washer, while the rib, against which the pipes abut, forms a vertical washer, and the flange, extending laterally into the pipe, forms a seal to the joint. The greater the pressure of gas in the mains, the tighter becomes the joint. The joint is flexible and non-corrodible and, being electrically insulating, acts as a preventive of electrolytic corrosion of metal pipes.

The sleeve, rib, and flange form one integral whole and can be easily fitted by hand on to the end of a pipe at trench-side, the operation of fitting it into position being facilitated by the lubricating effect (while liquid) of the rubber cementing solution with which the joint and pipe are smeared. The actual jointing in the trench is effected by bringing the pipes together after smearing the adjoining pipe end and the rubber sleeve with the adhesive; consequently the time occupied in making the joint is virtually nil.

It may be mentioned that the holding power of the rubber cement—a form of specially treated rubber latex—is such that when once well "set" the rubber becomes virtually chemically bound with materials such as asbestos cement and cannot be forcibly drawn off the material to which it adheres without tearing away the surface on which it rests. Its hold on metals is likewise remarkable as shown by the longitudinal pull required to separate two pipe ends. (The National Physical Laboratory "stripping and tensional pull" tests on two newly made all-rubber joints on pipes of 2 in. bore showed that the former required 2 tons and the latter 1,612 lb. respectively to strip and to separate the pipes.)

It is claimed that by the use of plain-ended metal pipes and dispensing with the socket of the iron and the overlapping sleeve of steel pipes a considerable saving of cost and of weight of pipes is effected. The most important economy, however, it is claimed, is that due to the prevention of leakage of gas at the joints.

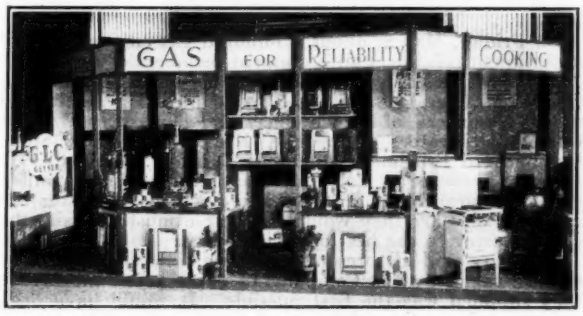
Road and Motor Spirit Problems

300 Delegates for Conference

Important points concerning road problems and the production of motor spirit from coal will be discussed at the International Road Tar Conference and the International Conference of Benzole Producers which are to be held at the Gleneagles Hotel from June 9 to June 13.

Nearly three hundred delegates from many countries, including Great Britain, France, Germany, Italy, Spain, Belgium, Czecho-Slovakia, Holland, and Switzerland, will attend. The object of the International Conference of Benzole Producers is to encourage the development of home markets in the respective countries by popularizing the use of benzole.

Successful Exhibition at Andover



A successful exhibition was recently held in conjunction with Messrs. R. & A. Main, Ltd., in the local Guildhall by the Andover Lighting and Power Company. Miss M. K. Gompertz, M.C.A., gave demonstrations twice daily with both the ordinary gas cooker and one adapted for use with Calor gas. The Hall was well filled at each session, while nearly 80 entries were received for the cake-baking competition on the concluding day. A novel feature on this occasion was the introduction of a separate class for competition among the Company's employees. The prizes were presented by Mrs. Holmes, wife of one of the Company's Directors. Our photograph shows the exhibition stand.

Coal Marketing Boards

A Municipal Protest

Salford Council, at its meeting last week, decided to ask the three local M.P.'s to fight an order which will shortly come before the House of Commons to establish coal marketing boards throughout the country, each with a constitution similar to the one already created in the Lancashire and Cheshire coalfields.

The Council discussed a resolution of the Light, Heat, and Power Committee protesting against the granting of absolute monopoly powers without compensating obligations to an Industry privately owned and controlled. The Committee felt that all future orders should make it obligatory on the marketing boards to meet the essential requirements of public utilities by supplying suitable coal; make it illegal for the boards to show price preference between one coal user and another for the same quality of coal; and make provisions for impartial tribunals to give decisions in case of appeals. Ald. J. H. Kearns, Chairman of the Committee, said that since the formation of the Lancashire and Cheshire Selling Board last July coal prices had increased by 2s. 6d. to 3s. a ton on previous contracts. Complaining that municipalities had no representatives on boards or committees set up by the Government, Ald. Kearns said that if no action was to be taken within twenty-one days the Corporation would have to pay 3s. a ton extra for its coal.

Well-Known Gas Water Heater Firm

Guests of Ascot Gas Water Heaters, Ltd., Assembled at the Inaugural Dinner.

Open Manchester Branch

On Friday, May 8, about a hundred gas engineers, local government officials, and prominent members of the Smoke Abatement Society were present at the formal opening by Col. W. M. Carr, O.B.E., T.D., President of The Institution of Gas Engineers, of branch offices and showrooms of Ascot Gas Water Heaters, Ltd., at 51, King Street, Manchester. Dr. Bernard Friedman, Managing Director, presided. He said the presence of Col. Carr was a great honour and a great encouragement, and, speaking for the Directors, he assured Col. Carr they would do their utmost to assist the Gas Industry to the best of their ability.

Col. Carr said all present knew the time spent and the trouble taken by the Company to ensure that the article they supplied was the best possible. It would have been easy to take a line of less resistance and put upon the market an article of not quite the same quality, but if that course had been taken the Company would not have built up its business as it had done. The vast field of water heating could be secured for gas by adopting a tariff that appealed to the consumers. Such a tariff might seem, on the face of it, to involve the undertaking in loss of revenue, but from his own experience he was quite certain that any temporary loss would be made good if the tariff was backed up by good salesmanship. The gain through additional consumption far exceeded what was lost where the consumer put into his own pocket the saving effected and did not use more gas. The sooner these appliances came into general use the nearer would the gas undertakings be to securing the load which rightly belonged to them.

Col. Carr was unable to attend the reception and dinner held at the Midland Hotel, Manchester, in the evening. A telegram from Mr. J. R. W. Alexander, Secretary of The Institution of Gas Engineers, conveyed his best wishes "for the success of this extension of your activities in helping to secure for gas the hot water load only the fringe of which has so far been touched." Other telegrams from the London staff gave assurances of loyal co-operation in striving for continued success, and extended to Mr. George Vernon, the newly-appointed Manager of the Manchester Branch, the best wishes of the Company and his colleagues for success and prosperity.

Appliances of Paramount Importance.

After the toast of "The King, the Duke of Lancaster," had been honoured, Dr. Friedman said it gave him great pleasure to welcome his guests. It was about nine years since he began to supply gas-operated hot water appliances in this country. Work, sometimes hard, always strenuous, had been needed to establish a market for the Company's special instantaneous type of appliance, which was now recognized by the Gas Industry as being of paramount importance to its future progress. He had been persistent in his efforts; without the generous support of friends his efforts would have been more arduous and the path of progress more difficult. He often wondered whether he could have continued his endeavours if that generous support had been withheld. The presence of his guests on this occasion demonstrated that they regarded him as a friend of the Gas Industry, whose ambition and desire was to help them to secure increased gas sales and more efficient service to the consumer. Service was of the greatest importance and the opening of the Manchester Branch would make possible still better service in Lancashire, Cheshire, and Yorkshire.

An Opportunity for Manchester.

Mr. A. L. Holton, President of the Manchester and District Gas Engineers Association, said the action of the Company in choosing Manchester for the establishment of a Branch was appreciated very much. In fitting up the new showrooms they had demanded the best in gas fires and fittings, and gave the Manchester people an opportunity of showing what they could do so that other goods were advertised besides those of the Company. Praise was due to the Company for supplying a good article. The knowledge that it was a good article increased the confidence of those who installed it, and the fact that so many people now were manufacturing appliances of the highest order made it possible for the gas undertakings to sell their commodities with satisfactory results. The Company were giving of their best in the way of service to the Gas Industry, and with great pleasure he proposed the toast of "Ascot Gas Water Heaters, Ltd."

Mr. H. Stanley Taylor, President of the British Commercial Gas Association, supported the toast. He said the Company had an honoured name in this country; they were great supporters of the Gas Industry; by making good apparatus they were enabling the gas undertakings to dispose of their products. The better these appliances were made the better for the Gas Industry as a whole.

Replying to the toast, Dr. Friedman said he knew better than anyone present what a hard task it was to introduce the "Ascot" gas water heater, but he persisted with the kind help of his friends and he thanked them very much. He would continue to carry on and in that way hoped to be of service to them, to their customers, and to the Industry generally. He could not find words adequately to express his gratitude for the kindness he had received, especially from Col. Carr.

Gas for Elie Public Lighting

Electricity Offer Rejected

In the absence of Provost Robb, Bailie Greig presided at the monthly meeting of Elie and Earlsferry Town Council, when the estimates for street lighting came up for discussion.

Two offers were lodged—one from the Fife Electric Power Company with an approximate offer of 100 watts at £1 10s. per lamp, without maintenance; and the other from St. Andrews Gas Company, Ltd., with an offer to supply the burgh and with gas lighting equal to 160 candle power at £1 12s. 10d. per lamp. It was pointed out that although the cost appeared greater there would be 50% more light. The St. Andrews Company also undertook the expenses of maintenance. It was unanimously resolved to endorse the recommendation of the Lighting Sub-Committee and accept the offer of St. Andrews Gas Company.

Another Essex Showroom for The Gas Light and Coke Company

In a district which has been described as "a phenomenon in municipal history"—namely, Dagenham—the Gas Light and Coke Company have added one more to their ever-growing list of up-to-date showrooms.

One hundred thousand people are now living at Dagenham in a district which only a comparatively few years ago was nothing but fields. The London County Council have created a town and built 26,000 houses and flats in each of which gas is provided for cooking, washing, and heating, and is available for water heating and refrigeration as well. The Council have made miles of roads, built a swimimng pool, libraries, and acquired 300 acres for parks and open spaces.

The Gas Light and Coke Company have been quick to realize that a new town like this needs a gas showroom, and such premises were opened on May 6 by the Chairman of the Dagenham Urban District Council at 8, Station Parade, Heathway, Dagenham. Previous to these new showrooms, consumers had to go to Barking in connection with their gas supply.

Following their usual procedure, the Company have set out the showrooms on thoroughly up-to-date lines, with an attractive, yet unostentatious, decoration scheme. The various types of gas appliances are sectionalized, and many of them, particularly the fires, are pleasingly displayed in appropriate settings. A special section is devoted to gas water heating, the various heaters being grouped in an alcove effectively illuminated from above. There is a fine display of cookers in coloured enamel finishes, while refrigeration, of course, receives prominent treatment. The lighting fittings are particularly effective, all being switch controlled, and there is the usual "gadget" table which has now become a regular feature of Gas Light showrooms.

The Opening Ceremony.

The opening ceremony was performed by Mrs. L. Evans, J.P. (Chairman of the Dagenham Urban District Council), who was supported by other members of the Council and prominent local residents. Tea was provided at the kind invitation of the Gas Light and Coke Company, Mr. A. E. Sylvester (Comptroller of the Company) presiding in the absence of the Governor, Sir David Milne-Watson, who, with the General Manager, Mr. R. W. Foot, was detained in London in connection with the Company's Parliamentary Bill proceedings. With Mr. Sylvester, were Mr. Stephen Lacey (Controller of Gas Sales), Mr. R. W. Lowman (Sales Manager), Mr. S. C. Leslie (Publicity Manager), and other senior officers of the Company.

Mr. A. E. SYLVESTER apologized for the absence of the Governor on that occasion. Sir David, he said, always made a point of being present if he possibly could at the opening of new showrooms; but at the present time their Parliamentary Bill required his presence in London, where he was that day, together with the General Manager. For this reason the duty fell upon his own shoulders—and it was a duty which gave him very great pleasure indeed.

Dagenham, he observed, was described in the Municipal Year Book as quite a phenomenon in municipal history. In the year 1921 there were something like 9,000 residents in the district; at the present time the population was estimated to be 100,000. In those fifteen years, from 1921 to 1936, the population had increased by ten times—which was a most amazing thing. He supposed that if one were to look for the reason they would find two chief causes for this extraordinary growth. One of these was the policy of the London County Council in building such a large number of houses on the Becontree estate, which formed a considerable part of that area—and the other was the arrival of large industries in the district, most notable of which, of course, was the Ford works. Those two factors had contributed very largely indeed to this expansion, which he was informed created a record extension in English municipal history.

An Example of Public Service.

Not only had Dagenham extended in this manner, however, but it was also a shining example of public service, and the Council were very much alive in providing those services. They in the Gas Industry were also alive and worked very hard to make their presence felt. Thus it was that they were opening these showrooms—in order that they might show the people who lived in that neighbourhood what they had to sell. They considered that they would be coming into line with the generally progressive spirit of the district if they opened gas showrooms there.

In other ways, too, they endeavoured to show that they were alive. Recently there had been a strenuous effort to bring refrigeration to the notice of the public. A few years ago domestic refrigeration was almost unknown in this country, but enormous strides had been made in that connection, and at the present time more business was being done with gas refrigerators than was being done with electrical models. Again there had been tremendous progress in the development of gas water heaters during the last few years, not only in appearance but also in cost. In bringing forward these new ideas—gas refrigeration was entirely new and water heating comparatively new—they had not neglected the older methods of using gas. Particularly would he refer in this connection to cookers. Many of them would remember that the gas cooker used to be a "rather black object;" but this had all changed. A few years ago the Gas Light and Coke Company's technical staff set out to design a cooker which would supersede the old black type and enable them to offer to the working man an enamelled cooker which he could quite easily afford to pay for. This had been done during the last year or two, and on the Becontree estate more than half of the 26,000 houses had these new enamelled cookers.

In the new showrooms the public would be able to see just what strides had been made in the design of gas appliances, and he hoped they would regard these premises from two aspects—first, as a "shop" in which the Company displayed their goods, and, secondly—and more important—as the centre from which their service operated. He was sure they would find Mr. Palmer, the Local Manager, and his staff—which consisted of about eighty people working from this centre—ready helpers. They on their part would regard the public not merely as potential customers but also as friends, and he hoped the residents in the district would find in the Manager and his staff real friends and advisers.

In conclusion, Mr. Sylvester called upon Mrs. Evans to declare the new premises open, at the same time thanking her for her presence with them on that occasion.

A Prominent Part.

Mrs. L. EVANS J.P. (Chairman of the Dagenham Urban District Council), said what an honour it was to her, as Chairman of the Urban District Council, to be called upon to declare these showrooms open. Gas played a very prominent part in the lives of women, and commenting upon the Comptroller's reference to cookers, she remarked upon the great advantage she herself had gained since using a cooker with automatic oven control. The Gas Industry, went on Mrs. Evans, provided a great deal of work in South Wales, from which district she herself came. The coal miners were very hard hit in South Wales at the moment, and if it were not for the Gas Industry things might be much worse. For this reason it was a double pleasure to her to declare these showrooms open.

Referring to the Gas Light and Coke Company, Mrs. Evans said that it was the largest gas company in the world, and utilized three million tons of coal a year, which, as she had stated, all provided work for the miners, whether they were in South Wales or the North. Then the Company supplied 540 square miles with light, heat, and power through 5,500 miles of mains. Their increased sales of gas last year amounted to 500 million cu.ft., which resulted in much less smoke and soot—another pleasing feature. Again, there had been a record turnover of appliances; in fact, appliance sales averaged one per minute throughout the whole of the year 1935—almost like the output of Ford cars, which were turned out at about the same rate, she humorously added. This year gas had been more prominent at the *Daily Mail* Ideal Home Exhibition; this specially applied to gas fires, cookers, and refrigerators in the model houses and flats, as well as gas for hot water and central heating. There were also four specially designed all-gas kitchens.

These new premises would be a great asset when consumers wished to consult the Company on any occasion. She also hoped that they would also assist the Company's employees who previously had to operate from Barking, involving considerable journeys to and from their work. In this respect the Dagenham showrooms should save many working hours. She therefore hoped that the showrooms would be of benefit to their employees as well as their consumers. She wished the Company everything that they would wish themselves, and expressed the hope that they would do such good trade there that they would later build another showroom in another part of the district because this one could not cope with the business they were doing. In conclusion, Mrs. Evans said she had great

pleasure in declaring this—the Company's first—showroom in Dagenham open for the general use of the public.

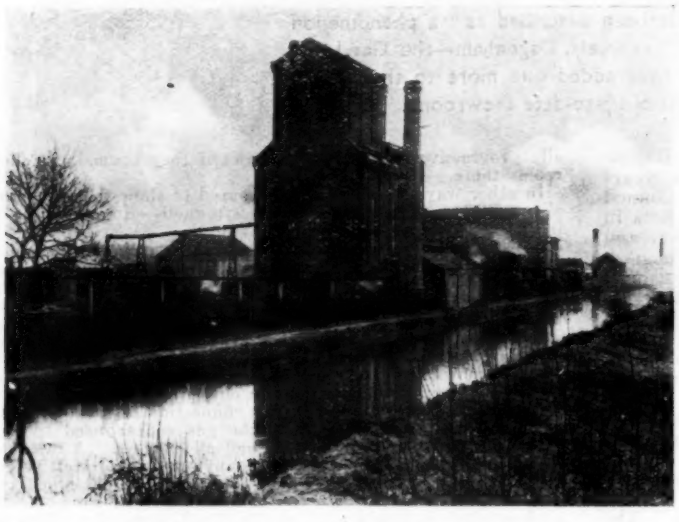
The opening ceremony over, the guests spent some time inspecting the new premises, while members of the sales staff of the Gas Light and Coke Company were ready to explain any points of interest to the visitors.

These showrooms will serve about 22,000 people, and will have a staff of eighty attached to them when the new fitters' depôt is completed.

Reconstructed Gas-Works

Inaugurated at Stratford-upon-Avon

The reconstructed gas-works of the Stratford-upon-Avon Gas Department are to be inaugurated to-day. The following notes on the new plant are extracted from a brochure prepared for the occasion.



A View of the Gas-Works looking across the Stratford-upon-Avon Canal, showing the new Glover-West retort house.

The Scheme of Remodelling.

The growth in the business of the Stratford-upon-Avon Gas Department since 1927 was such as could be met only by the modernization of works equipment on an extensive scale. This development presented the Corporation with an opportunity to re-plan the disposition of the various works units.

Negotiations were opened with the Great Western Railway Company, leading to the purchase in 1933 of a triangular plot of land to the north-west of the works site. By acquiring this land the Undertaking gained ample space for very many years' development, and the advantage of railway siding accommodation to supplement the canal facilities on the southern boundary.

The remodelling scheme was divided into three sections:

(1) The installation of new ancillary plant on the extended site, comprising a condenser, exhausters, washing units, and purifiers with gas heating equipment.
(2) The installation of new carbonizing plant to take over the entire gas production of the works, and
(3) The demolition of the existing horizontal retort house and its reconstruction as workshops, stove-cleaning shops, and stores.

Work on Section (1) was spread over the years 1933 and 1934.

The new condenser is of the modern water-cooled type in vertical casing, and was constructed by Messrs. Newton, Chambers & Co., Ltd.

Two complete units are contained in the new exhauster house, consisting of steam-engine-driven rotary gas exhausters manufactured by the Bryan Donkin Company, Ltd., capable of passing 50,000 and 25,000 cu.ft. of gas per hour respectively.

Grouped together in the new washer house building are a Livesey washer and tar extractor, constructed by Messrs. Newton, Chambers & Co., Ltd., with a Holmes static washer and a Holmes rotary washer, installed by Messrs. W. C. Holmes & Co., Ltd.

The purifiers, erected in 1934 by Messrs. C. & W. Walker, Ltd., consist of two boxes, each 25 ft. by 25 ft. by 6 ft. deep, of the luteless type, each box having two covers. Connections are arranged for either forward or backward rotation with either box off. Milbourne reverse flow valves are fitted inside the boxes at each inlet and outlet, so that the flow of gas may be upward or downward through the oxide as desired.

A Walker steam tubular heater is fixed in front of the purifiers.

The Carbonizing Plant.

The starting-up of the first section of new equipment was coincident with the beginning of work on the carbonizing plant. It was decided to install a Glover-West vertical retort plant of sufficient capacity to deal with the whole load.

Erection was started on the carbonizing unit by Messrs. West's Gas Improvement Company, Ltd., in February, 1935, and the plant was put into full commission in the following September, when the existing retorts ended their working life.

There are eight retorts of the Glover-West New Model steaming type in the installation, arranged in four distinct and separable units, each containing two retorts. Any retort can be shut down at will—as, for example, during scurfing—without affecting the retort adjacent to it. Fuel gas is drawn from a common flue served by two step-grate, breeze-burning producers, either of which is capable of supplying six of the eight retorts. The plant conforms to the modern Glover-West design, with an adequate system of platforms and staircases for access to all parts. The retort house equipment includes an "Arca" automatic regulator controlling the pressure of gas passing into the foul mains. An automatic contrivance operating a bell has been installed, which gives warning to the workmen in the event of the water-feed tank to the regulator becoming low. A Spencer-Bonecourt horizontal induced-draught waste-heat boiler is arranged at the retort charging level, capable of raising 2,480 lb. of steam per hour at 120 lb. per sq.in. working pressure.

The coaling apparatus is of a type found particularly suitable for modern retort-house installations of this size. A skip-hoist of West design runs in channel guides from a loading pit below ground level to a point above the coal storage bunkers over the retort setting. An extension from the railway sidings passes over the loading pit, and coal from railway wagons is fed direct to a receiving hopper, from which in turn the skip-hoist takes one-ton charges of coal, delivers them into the overhead coal bunkers, and returns to repeat the operation. The loading, travel, and discharging of the skip are entirely automatic and continue as long as the driving unit—a totally enclosed vertical two-cylinder steam engine of the automatic reversing type, manufactured by Messrs. W. Sisson & Co., Ltd.—is kept in action. With a continuous supply from the receiving hopper, coaling can proceed by this means at the rate of 20 tons per hour on a skip speed of 100 ft. per minute. The safety device takes the form of powerful automatic braking equipment, which would come into instantaneous operation in the eventuality of a failure of the hoisting gear.

The third and final section of the works re-planning is still proceeding. It provides for the replacement of the old horizontal retort house facing the offices by enlarged workshops for the gas fitters and for stove cleaning, together with new stores. At the present juncture the old retort bench has been taken down and the building is in course of demolition.

The Society of British Gas Industries

Presidential Address

The Annual General Meeting of the Society of British Gas Industries was held on May 13 at the May Fair Hotel, Berkeley Street, W. 1, under the Presidency of Sir John Cadman, G.C.M.G., D.Sc., whose Presidential Address we reproduce below.

THE PRESIDENT.

SIR JOHN CADMAN G.C.M.G., D.Sc.

At the early age of 23, Sir John Cadman was in charge of a colliery in Stafford, which position he vacated two years later to become, in 1902, a Mines Inspector, in which capacity he undertook special research work for the Commissioner of Mines. Later he became a Professor at Birmingham University, while during the war he joined the Oil Section of the Department of Overseas Trade. The knowledge Sir John Cadman gained as a member of the Royal Commission appointed to study the Persian oil-fields led to his Chairmanship of the Anglo-Persian Oil Company, in which capacity he was largely responsible for the great engineering feat which made possible the £10,000,000 pipeline from the Iraq oil-fields to the Mediterranean. Sir John is one of the world's foremost experts on oil and coal. In 1934 he was the recipient of the Melchett Medal for research of an outstanding character, involving the scientific preparation and development of the use of fuel. He is President-Elect of the Institute of Fuel.

"Great Britain and the Oil Industry"

by

Sir John Cadman

The petroleum industry owes its birth to a Scotsman, James Young, who in 1847 started the refining of mineral oil, procured from a seepage in a Derbyshire coal pit. Young imagined that the oil had been produced by the action of heat on the coal, so, when his supply of oil eventually failed, he naturally treated coal in order to maintain his supply of oil. Cannel coal was, in fact, successfully treated by him.

Young's supply of cannel coal, however, soon became exhausted and, in searching for other sources of supply, his attention was called to the oil shales of Linlithgowshire. These shales proved highly profitable, and it was not long before a number of Scottish companies, the forerunners of Scottish Oils, Ltd., were supplying the British and European markets with lamp oils and other products. The internal combustion engine not having been invented at that period, the petrol obtained from the shale was treated as a waste product.

A serious blow was struck to this young and flourishing industry, however, in 1859, when a certain Colonel Drake, when drilling for water in Titusville, Pennsylvania, struck oil at the shallow depth of 69 ft. The discovery of this oilfield led to the area being fully exploited, and Pennsylvania soon became the centre of the oil industry. Young, of course, had to retort the shale in order to obtain his oil, and this fact alone was sufficient to make it difficult for him to compete with the new enterprise in Pennsylvania. The shale oil industry did survive, however, and it is still, to this day, in active operation.

The growing demand for products of mineral oil led to the subsequent search for other oilfields. Prolific fields were eventually proved in other parts of the United States, and in Venezuela, Mexico, Russia, East Indies, and Roumania. Very little oil, however, was found in British territory, and the advent of the internal combustion engine served only to aggravate this unsatisfactory state of affairs.

The discovery of oil in Iran in 1909 through British enterprise, however, placed a large supply of crude oil in the hands of a British company. These Iranian oilfields, situated at Masjid-i-Sulaiman and Haft Kel, some 145 miles from the Persian Gulf, contain a vast store of oil. The A.I.O.C. have obtained altogether some 85,000,000 tons of crude from these fields since the end of 1911.

Oil in Iraq.

Another major field, in which British interests are largely represented, is now producing annually some 4,000,000 tons of crude. This field is in Iraq, and is proved to be some 2 miles wide by 50 miles in length. The Iraq Petroleum Company was incorporated in January, 1911, but under a different name. In March, 1925, the Company obtained a concession from the Iraq Government. Four years later the Turkish Petroleum Company, as it was then, was re-named Iraq Petroleum Company; and in 1931 the terms of the concession were revised and cast in their present form.

Under the concession, the Company was granted exclusive rights within a defined area to "explore, prospect, drill for, extract, and render suitable for trade petroleum." The defined area comprised—with certain exceptions—all lands in the vilayets of Baghdad and Mosul bounded by the east bank of the River Tigris and the Iraqi-Turkish and Iraqi-Iranian frontiers. An obligation was laid upon the Company to construct a pipeline system from its concession area to the Mediterranean; and it was provided that the system should be completed not later than Dec. 31, 1935.

The international aspect of the Company is clear when it is realized that four blocks of 23·75% of the shares are held separately by a British, an Anglo-Dutch, an American, and a French group, and the remaining 5% by Participations and Investments, Ltd. The principal petroleum nations of the world are, therefore, united in the Iraq Petroleum Company; and within that Company, for the first time, representatives of the petroleum interests of those nations have collaborated in the work of developing a jointly-held concession.

Oil was discovered in Iraq in October, 1927, when the first well at Baba Gurgur, north of Kirkuk, was brought in with a production of 5,000 tons a day. Until recently, that discovery of oil had virtually no effect on the oil situation in the Middle East or elsewhere. There is no market in Iraq for the great quantities of oil which are available from the Kirkuk field; and, before they could exert any influence on the markets of the world, a pipeline had to be laid from Kirkuk to the Mediterranean. The actual laying of the pipeline was commenced in October, 1932, and completed in November, 1933.

Prior to the construction of the pipeline, it was decided, for various reasons, that there should be two terminals on the Mediterranean coast, Haifa to the south and Tripoli to the north. For 156 miles from the oilfield at Kirkuk to Haditha on the Euphrates, the two sections of the line run together. At Haditha they separate, the southern section continuing through Iraq, Trans-Jordan, and Palestine to Haifa, while the northern section leaves Iraq near Abu Kamal, thence traversing Syria to its point of termination at Tripoli. The distance along the pipeline route from

Kirkuk to Haifa is 620 miles, and from Kirkuk to Tripoli 530 miles—an aggregate of 1,150 miles.

The Iraq Pipeline.

Almost the entire route of the pipeline system lies in desert wastes, unequipped with roads or railways, possessing few towns, and unpopulated save for scattered tribes of nomads. Water existed at certain points, but was inadequate in quantity or quality. The preliminary operations of surveying possible routes and determining those which were ultimately chosen occupied a considerable number of months. Finally, decision was made and preparations for the work were put in hand.

The country through which the pipelines run may be described as desert. Its nature, however, differs from section to section. Between Kirkuk and the Tigris few geographical difficulties were encountered, but the approaches both to this river and to the Euphrates are rough on either bank and called for some engineering ingenuity in their negotiation. From Haditha through Rutba and as far as Burqa, a distance of some 270 miles, the obstacles to pipeline construction were limited to stretches of rather rough country, occasional patches of rolling stony ground, and a few small streams. From Burqa to Jebel Asfar the line traverses its most difficult section. Between these points there lie 70 miles of "lava country." The surface of the ground is covered with basaltic rock which in some places takes the form of a solid sheet and in others—the greater part—exists as boulders varying from 6 in. to 1 yd. in diameter. The sand beneath the boulders is loose and abrasive.

At this point I might mention that transport across the lava country was found to be practically impossible, and it became necessary later to construct a metalled road across it in order to facilitate transport of materials from the Mediterranean to the inner desert regions of Iraq. The road is 90 miles long and sufficiently wide to accommodate two lines of heavy traffic.

From Jebel Asfar the pipe-line turns to a west-north-westerly direction, traverses flat country to Mafraq, and then enters limestone hills of increasing heights as it approaches the River Jordan. At its highest point, 18 miles east of the Jordan, the pipeline is 2,600 ft. above sea-level. When it reaches the Jordan it has fallen 3,450 ft. to 850 ft. below sea-level; and in a further ten miles it rises again to 750 ft. above the sea. Thence it falls in a steady slope through the plain of Esdralon to Haifa on the Bay of Acre.

The northern section of the line encounters no obstacle comparable in magnitude to the lava country crossed by the southern line. From Haditha to Palmyra the northern route traverses ground which is stony or rocky, broken by occasional deep rivers, notably the Wadi Ratqa, 92 miles from Haditha. The elevation of the line rises gradually as far as Palmyra and thence climbs steeply from 1,250 ft. above sea-level to 2,000 ft., over a rocky saddle in the hills. The climb continues, more gently, as far as El Furklus, where it reaches 2,600 ft., and proceeds through stony limestone hills falling fairly sharply as far as the valley of the Orontes whence, after a final rise from 1,600 ft. to 1,750 ft., the line drops gradually to its termination at Tripoli.

So much for geographical factors and features. We may now turn our attention to the operations involved in laying the pipeline.

The aggregate length of the two sections of the line, as you will remember, is 1,150 miles. The weight of the pipe required was 120,000 tons—approximately 100 tons a mile. The aggregate cost of the Iraq pipeline was approximately £10,000,000. A large part of the total expense was, of course, spent in the countries traversed by the pipeline and on freight and other charges.

It is evident that the transport of this quantity of steel tubing, and of the appurtenances to the pipeline, was in itself a tremendous task. If further figures are needed to suggest its magnitude the fact that some 22 million ton-miles of transport were involved should suffice to fill the gap. The transport of heavy materials over desert regions is far from being a simple operation. The surface varies, being composed in some areas of loose sand, in others of irrigated farm land, limestone grit, or boulders of lava. On several occasions during winter a large part of the desert becomes a morass for days at a time and transport is impossible.

In addition to difficulties such as these, two rivers—the Tigris and Euphrates—flow across the track of the pipeline; and, since they are unbridged, called for special methods of negotiation. Ferries were out of the question because, during the spring floods when the mountain snows are melting, the current is too swift for the safe navigation of considerable loads.

At both rivers a "Blondin," or overhead cable-way, was erected. Steel towers standing on concrete foundations were erected to support a steel rope-way over the river. Across this cable—which was nearly 7 in. in circumference—loads as great as 10 tons could be lifted from one bank and deposited on the other. When necessary a lorry complete with its load could be carried across the river without disturbance of its contents and allowed to proceed with a minimum of delay. The span between the towers, in the case of each river, was nearly 2,000 ft.; and in order to permit the passage of river craft and to make allowance for the sagging of the cable during hot weather the towers were of considerable height—130 ft. for those beside the Euphrates and 140 ft. on the Tigris.

I have mentioned these matters of detail in order to give you some conception of the great amount of preparatory work which was necessary before the laying of the pipeline could commence. Transport operations began three months before the arrival of the men who were to perform the actual welding of the pipe.

Difficulties of all kinds were encountered. Flooding delayed operations repeatedly. At times, lack of security from attack by wandering tribes made it necessary for vehicles to travel in convoy, guarded by an armed escort. Passage across the lava country was extremely difficult at all times owing to the blinding and suffocating dust which rose around each vehicle. Drivers were blinded for hours on end by a travelling dust cloud which prevented them from seeing more than a yard or two ahead. The engines and transmissions of lorries were cut up by abrasive dust. Nevertheless the preliminary work was done; and in due course sections of pipe were "strung" along the route which the line was to follow.

It had been decided for various technical reasons that the pipeline should be buried throughout its length. The first operation therefore was the digging of an adequate trench. Fortunately little manual labour was required for the task, or we should never have arrived at its end. Most of the work was done by ditching machines. These consist of a caterpillar tractor bearing a power unit which operates an excavating wheel overhanging the rear of the unit. The wheel is equipped with steel buckets which pick up the soil—including boulders of 15 in. in diameter—and drop it on to a conveyor belt which throws it neatly and continuously beside the excavated trench. The type of ditcher used by the Iraq Petroleum Company is capable of cutting a trench over 2 ft. wide and 6 ft. deep at an average rate of approximately a mile a day.

In places the ground, being composed of rock, was too hard for a ditching machine to operate. Recourse was had to blasting. A line of holes was drilled by pneumatic machines of the type which may be seen any day at work in the streets of London. Explosive charges were placed in each hole and the line of charges, fifty or more, was fired simultaneously. The blasting and the operation of the ditching machine formed a remarkable spectacle, and the proximity to the pipeline route of many great works of antiquity made one wonder how those were accomplished with only manual labour for power and primitive implements for mechanism. The contrast was inspiring.

The scene was now set for the next act—the welding of the sections. The pipe used by the Iraq Petroleum Company was supplied in 40-ft. lengths. The ends of each section were expanded, or swelled to accommodate a sleeve which fitted into the adjacent ends of the two contiguous sections, the effect being similar to the junction of two pieces of rubber tubing by slipping the ends over a metal union. The sleeve facilitated joining the pipe and was so constructed that the interior of the pipe was of constant diameter throughout. Thus there is no obstacle to free passage of the oil through the pipeline. In addition, the presence of a sleeve at each joint prevented the formation during welding of "tear drops," which in the aggregate would have caused a serious increase in the flow-resistance of the line as a whole.

When welding was about to start ten or eleven 40-ft. lengths of pipe were lined up. Each joint was "tack-welded" at three points to provide a first bond between two sections. These were then rotated and the complete welding was performed in two revolutions of the pipe, the area to be welded being turned uppermost to enable the welder to work always in an upright position.

In due, and rapid, course a 400-ft. length of pipe was prepared ready for junction with the remainder of the line and for deposit in the trench. Evidently at the point of junction it was impossible for the line to be rotated for the convenience of the welder. At such a point therefore a pit was dug beneath the line and a highly skilled welder carried out the final operation of adding yet another length of pipe to make up the 1,150-mile line. Thereafter the welding gang, composed of twelve welders and some 300 general labourers, moved on.

The metal of which the pipes are composed is steel. In several regions through which the line passes the soil contains corrosive salts which would speedily eat into bare metal. Measures had to be taken therefore to guard against corrosion, and as soon as a section of the line had

been welded protective substances were applied. A mechanical cleaner fitted with rotating brushes—first wire, then coir—was drawn along the pipe. The wire brushes removed all dirt and rust, leaving a clean steel surface on which the coir brushes deposited a coating of "primer." When that had dried, a protective enamel was applied by hand. Hot enamel was ladled on to the upper side of the pipe, and, as it ran down, was spread evenly by a strip of canvas passed under and around the pipe and worked backwards and forwards, a remarkably even distribution being obtained. Finally, the entire pipe was wrapped in asbestos.

By this time some of you may be wondering what was done to provide for the inevitable expansion and contraction of such great lengths of metal in a land where temperatures vary so widely between day and night and summer and winter. At the stage which I have reached in describing the laying of the pipeline there might be a mile or so of welded line ready to be laid on its trench. At points about 70 yd. apart the pipe would be seen to be supported on skids above the level of the ground. Between those points the line drooped into the bottom of the trench. In effect therefore the section of pipeline was longer than the trench into which it was to be fitted. If, however, it could be accommodated in the trench it would be under compression and allowance would have been made for a certain degree of contraction.

This theoretical solution of the problem had to be translated into practice. Evidently the pipe would not fall easily at all points into a trench which was slightly too short. It had therefore to be coerced. The skids were removed, and, at places where the pipe rose above its determined level, it was forced down by loaded caterpillar tractors. The soil remaining at the side of the trench was rapidly replaced to keep the pipe down. When all was finished the pipe lay securely at the bottom of its trench, providing a smooth transit for the passage of oil, protected from corrosion, and immune from vagaries of temperature.

After the completion of operations a slight disturbance of the ground marked the route of the pipeline. So far as the eye could see, there stretched an apparently interminable row of telegraph posts, running without deviation from horizon to horizon. Between the posts copper wires glinted in the sun. Elsewhere the desert remained unaffected and untouched. Nevertheless the passage of modern industry has left its mark. The posts and the wires form a track, visible for many miles on the surface or from the air, which, if followed by a traveller from Haifa or Tripoli, would inevitably lead to the Euphrates—to water, shelter, and roads. Never before has a path across the desert been so plainly marked.

The pipeline will lie in its trench for many years, and at twelve points on its course there will be pumping stations staffed by Europeans, Americans, and Arabs which, in a sense, will be nuclei of western civilized life. At these points also wells have been drilled for water. The supplies at present obtained may not be more than adequate for the requirements of the stations themselves, but the discovery of water in an arid and unproductive region is an accomplishment of note.

It is hoped that in the future it may be possible to plant a belt of trees around each of the pumping stations in the desert so as to afford some protection from dust storms.

The local inhabitants have learned, for the first time, something of sanitation and personal hygiene, and have been taught that the traditional customs of their tribes are not the rules which guide the rest of mankind. Preventive and prophylactic medicines have been introduced to them, with such a result that sickness among the Company's staff accounted only for a loss of half of 1% of men-days. Adequate feeding raised their strength and stamina to a point far above their normal level. Men of various nationalities and religious denominations—among whom contact frequently means instant trouble—have worked together without disturbance.

The Search for Oil in Great Britain.

The position regarding oil supply in the United Kingdom is interesting. A search for oil was first conducted in Great Britain between the years 1918/1922, by Lord Cowdray through S. Pearson & Co., Ltd., who acted as agents for the Government. Eleven wells were drilled and of these one alone, the Hardstoft well in Derbyshire, became a small producer. This well, incidentally, is close to the spot where, as I have previously mentioned, Young first commenced the production and refining of mineral oil.

From 1922 until 1934 the search for oil in Great Britain was virtually discontinued. During the latter part of that period, however, geologists of the Anglo-Iranian Oil Company were considering the problem and they came to the conclusion that there were reasonable prospects of oil existing in rocks of earlier ages—Permian in Northern Yorkshire and Jurassic and Lower Cretaceous in Southern England.

The petroleum legislation then in force did not encourage exploration. Any company operating in the United Kingdom could have obtained licences to prospect, drill, &c., but would have had to negotiate with large numbers of surface owners for rights of entry to land, wayleaves, and royalties payable on any oil which might be found. If oil development in Great Britain had been attempted under that legislation many of the worse features of U.S. oil activities (small lots, offsetting, &c) would have been brought into being in this country.

The passing of the Petroleum Production Act, 1934, however, put the enterprise on a sounder footing; the principal feature of that Act was that property in petroleum was vested in the Crown. The surface owners became disinterested in any oil that laid beneath their property, and underground oil structures, if discovered, could be operated as individual units.

The D'Arcy Exploration Company, a subsidiary of the Anglo-Iranian Oil Company, Ltd., has obtained licences from the Government to search for oil in the United Kingdom and is making a very determined effort to discover if oil really does exist within these shores. For the last few years the Company's geologists have been accumulating a vast amount of data which may lead to test-wells being sunk in various parts of the country. The test well now being drilled near Portsmouth is the result of very careful piecing together of a large volume of geological evidence, the result of which would certainly cause investigations to be made in any other country if the same evidence was forthcoming.

We may have to go down to 12,000 ft. or more before any results are obtained, as, although the underground structure at Portsdown, near Portsmouth, is, as far as we know, an ideal one, the drill alone can tell if oil has accumulated in the rocks below.

I have tried to give you a rather sketchy history of the growth of the oil industry. I have started with Young's enterprise in Derbyshire, the discovery of oil in Pennsylvania, the growth of other oilfields in and about the North and South American Continents, and elsewhere. I have shown you how a British enterprise discovered oil in Iran, the interest Great Britain holds in the Iraq oilfields, and finally have brought you back to the United Kingdom to show you how efforts have been and are being made to discover petroleum in the United Kingdom. Each of these sections alone could be the subject of an interesting story.

Stretford Gas Board Gives Traders a Lead

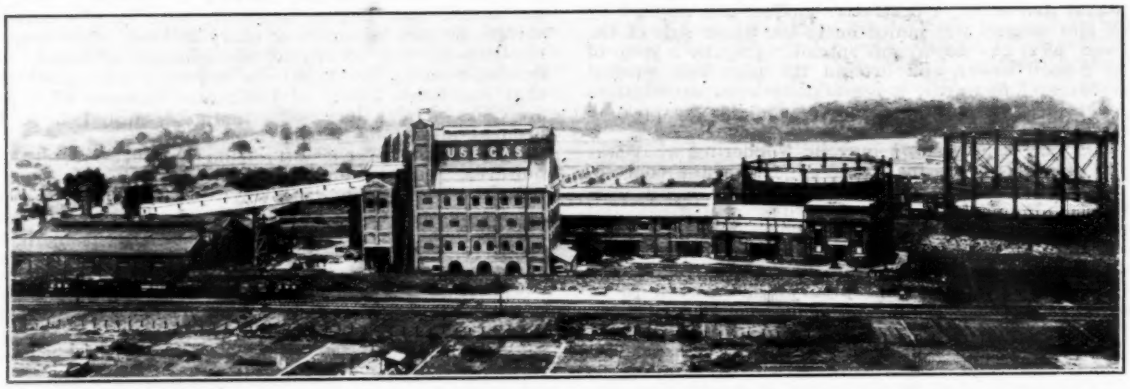
Health, Homes, and Fashions Exhibition

A Health, Homes, and Fashions Exhibition, organized by the Stretford and District Gas Board was opened last week at the Stretford Public Hall and is the first of a series of similar annual exhibitions to be organized by them. The Gas Board feel that ordinary straightforward gas exhibitions had not proved, in their extensive experience of them, to be of much value. It was always found difficult to persuade the public to visit an exhibition which relied for its main appeal purely on exhibits of gas fires, cookers, and boilers and on demonstrations of gas cooking, but where these were allied to other exhibits of a more general character the returns had been far more satisfactory.

Mannequin parades are held several times a day, and there are constant demonstrations of arts and crafts, cold cookery, gas appliances, labour-saving devices, radio, tobacco blending, and the Gas Board has itself arranged demonstrations of instantaneous gas water heaters, washing machines, and gas boilers. A slogan blazoned across the Gas Board's stand says "It Saves More than it Costs." The Economic Boiler Company, Ltd., of Burnley, devote their stand to working models of gas washing machines, and Ascot Gas Water Heaters, Ltd., link up with the Gas Board in displaying sink gas water heaters which may be hired for as little as 3s. 6d. per quarter, multi-point heaters and instantaneous gas water heaters. Easiwork, Ltd., 242, Tottenham Court Road, W. 1, give demonstrations of cooking, roasting, baking, steaming, stewing, and frying by gas. The Stretford and District Gas Board is also offering a gas water heater as a prize in a competition they are promoting in conjunction with the exhibition.

During the first three days 1,600 people attended the exhibition.

Eastern Counties Association



View of Bracebridge Works as recently reconstructed.

Hold Their Half-Yearly Meeting at Lincoln

The Half-Yearly Meeting of the Eastern Counties Gas Managers' Association was held on May 6 and 7 at Lincoln, in charge of which Gas Undertaking is their President, Mr. George Wright.

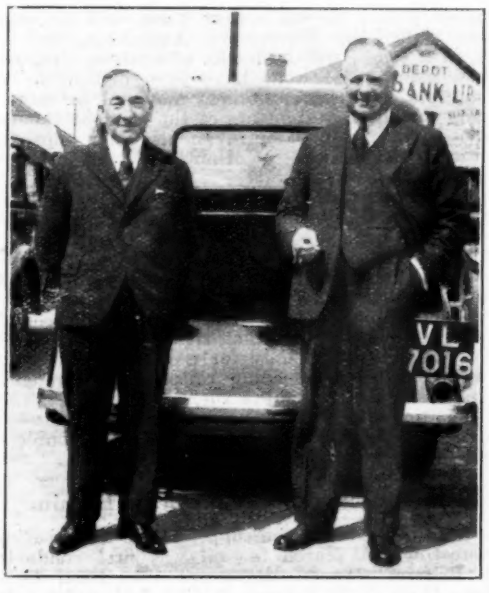
When considering Lincoln, it is natural perhaps that one's mind should immediately turn to the glorious Cathedral which occupies so striking a position about 200 ft. above the city proper. But Lincoln is noted also in other ways. History and tradition have weaved around it a web of romance which contrasts somewhat strongly with the numerous important business enterprises that make it a commercial city of no mean order. And this is not all. Endowed with a priceless heritage from the past, and marked by manifold manufacturing operations at the present time, Lincoln has yet another claim to fame in the boundless hospitality which it extends to those fortunate enough to be its guests. As visitors to their President, Mr. George Wright, who was appointed Engineer and Manager of the Lincoln Corporation Gas Undertaking some six years ago, the Eastern Counties Gas Managers' Association had overwhelming proof of this hospitality during their two-day visit to the city last week. Everything that a generous spirit, good organization, and scrupulous attention to detail could suggest went to the making up of a faultless programme for the members, while their ladies also were invited, and had special and complete arrangements made for their entertainment.

A Garden Gas-Works.

Members of the Association, accompanied by the ladies and a number of other invited guests, assembled at the gas-works on the Wednesday morning, and were greeted by the President, after which they were accorded a warm welcome by the Mayor of Lincoln (Councillor J. J. Leamy), who reminded his hearers that during the war Lincoln produced hundreds of aeroplanes, with much other fighting material, while it was also the home of the tanks. "To-day," he added, "Lincoln produces in its engineering works the largest pumps in the world, and nearly the largest excavators." The Mayor declared the Corporation's pride in its trading undertakings, and so far at any rate as the gas-works are concerned his hearers were fully in accord with this feeling—standing as they were in bright sunshine, among brilliant hued flower beds, and surrounded by gas plant painted wherever practicable in a restful shade of green—the whole scheme presenting irrefutable evidence that Mr. Wright is an artist as well as an engineer. Prior to the inspection, a group photograph was taken in the rock garden.

The visitors were then made up into parties, and the various features of the works were explained to them by the President, Mr. Bowden (Works Superintendent), Mr. Enright (Assistant Superintendent), and Mr. Twist (Distribution Superintendent). The works are in the Bracebridge district of the city, and were opened about sixty years ago, but since Mr. Wright's appointment they have been re-modelled and brought up to date. The maximum output is now 3 million cu.ft. a day. The original works, which were started up in 1830, were situated some distance away, at Newland, but the site and some of the old buildings have now been adapted for use as the distribution centre. This the members were afforded an opportunity of inspecting.

The modernization of the Bracebridge works was fully described by Mr. Wright in his Presidential Address, and readers will find illustrations of the main portions of the new plant in the issue of the "JOURNAL" dated July 5, 1933. Carbonizing is by means of a Woodall-Duckham continuous vertical retort installation. During the inauguration ceremony the then Mayor remarked that the members of the Council, and particularly the members of the Gas Committee, knew full well the value of Mr. Wright



The President, Mr. George Wright, of Lincoln (left), and the Chairman of his Committee, Councillor A. L. Bower.

to the undertaking and to the city generally. The whole of the work in connection with the modernization scheme had been carried out under the supervision of Mr. Wright, who had spared neither time nor effort. The members of the Eastern Counties Association, after their inspection, were fully in agreement with these remarks as to the value of Mr. Wright's services, but they also paid tribute to the business acumen of the Gas Committee and the Corporation,

without whose backing such a scheme could not have been brought to fruition.

Hospitality.

At the Saracen's Head Hotel the Association and friends were the city's guests at luncheon—the Mayor presiding—and here Mr. F. B. Richards proposed the toast of "The Chairman and Members of the Gas Committee." He said that from all they had seen that morning they had drawn their own conclusion—that the Corporation had put the

Among the flowers—Mr. Thomas Glover (Norwich), Mr. J. H. Troughton (Newmarket), and Mr. C. Bryan Donkin, of Chesterfield.

right man in the right place. Having done so, they gave him full support, and the results had been good service, cheap gas, and expanding sales. As the result of the courage and foresight of the Gas Committee, led by Councillor Bower, the undertaking was now second to none in the country, and an example to most. In the course of his response, the Chairman of the Gas Committee said that Lincoln fully appreciated the sterling worth of Mr. Wright both as an engineer and as an organizer.

A Thoroughly British Industry.

Among those present at the luncheon was Mr. W. S. Liddall, M.P. for the City of Lincoln, who proposed the toast of "The Association" in a speech in which, by the aid of a large number of convincing statistics, he sketched the progress of gas—"a thoroughly British industry." This progress, he said, was entirely due to the Industry's own efforts to keep its products and its appliances absolutely up to date. It was progress of which all those connected with the Industry had every right to feel proud. They ought, indeed, to congratulate themselves that they were associated with an Industry that could show such wonderful results at a time when competition was particularly keen. Mr. Wright was an efficient gas engineer, and his success had been the greater because with this efficiency he combined a charm of manner that never failed to convince the most disgruntled ratepayer.

Replying to the remarks of Mr. Liddall, the President said that to his mind the really alarming feature of the present state of affairs was the attitude of the Government towards an Industry which did so much good, and which was, indeed, essential to the welfare of the nation. He thanked the Mayor for the hospitality extended to the Association, and for the kindly interest which he had taken in the proceedings.

Regret was expressed by Mr. R. G. Shadbolt (proposing "The Visitors") at the absence of Colonel W. M. Carr, the President of The Institution of Gas Engineers, who was laid aside by indisposition, together with hopes for a speedy recovery, so that he might be perfectly well for the forthcoming meeting of the Institution. They were, however, fortunate in having with them to respond on behalf of the visitors Mr. A. L. Holton, Chief Engineer of the Manchester Corporation Gas Department, who happened to be President this year of the Manchester District Association of Gas Engineers. They regarded him as the leading optimist in the Industry. Another welcome visitor was Mr. C. M. D. Belton, Engineer, Manager, and Secretary of the Shrewsbury Gas Light Company, and a Past-President of the Midland Association of Gas Engineers and Managers. In conclusion, Mr. Shadbolt voiced his conviction that the revival of business in this country to-day was very largely due to the help afforded in various ways by the Gas Industry.

In the course of his reply, Mr. Holton made two important points. Referring to what had been said by Mr. Shadbolt as to his cheerful outlook, he declared: "I never felt there was more ground for the optimism I am always preaching than I do to-day." As to the gas-works, he remarked: "The cleanliness and the generally bright atmosphere of the works must tell in favour of an efficiency which many of us might well envy. We want to raise the dignity not only of ourselves, but of the men who work for us, and make them proud of their jobs."

Golf Competition.

On the previous day, over the Lincoln Golf Course, Torksey, members and associates played for the Association golf challenge trophy and replica, presented by Mr. Douglas W. Turner, while non-members were invited to participate in an optional sweepstake for which prizes were given. These were presented at the close of the luncheon. The challenge trophy was secured by Mr. C. E. Wright, of Ipswich, with a net score of 77, the second prize by the President, with a net score of 79, and the third prize by Mr. H. Saville, of Leeds, also with a net score of 79. Prizes were also awarded to Mr. C. E. Byrt, of Gainsborough, and to Mr. D. S. Glover, of Sutton. The winners among the non-members were Messrs. D. W. Turner, J. Cunningham, and S. Bramhall.

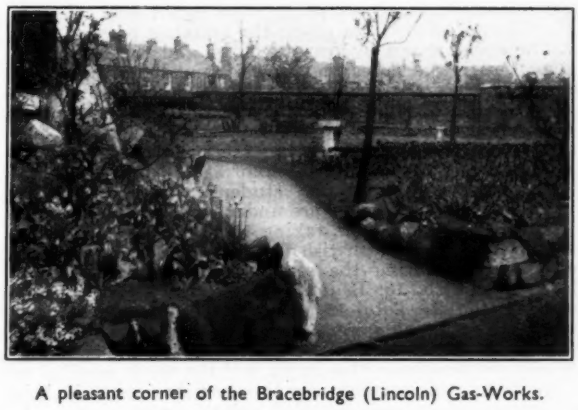
Mr. Turner, who gave away the prizes, said it had afforded him much pleasure to present the challenge trophy. Co-operation and good fellowship had been the hallmark of the Association since it started, and it was essential that that co-operation and good fellowship should remain in the future. Friendly rivalry in sport must encourage such a spirit, and there could be nothing better for this purpose than a game of golf.

Business Proceedings.

An adjournment was then made to the Technical College, where the business meeting of the Association was held, with the President in the chair. There were about 75 members present.

Reference was made to the regret felt at the death of Mr. Thomas Goulden, a Past-President, who had been a member of the Association since 1904; of Mr. A. Mitchell, of Bury St. Edmunds, who joined in 1891; and of Mr. H. Shewring, of Cambridge, whose sudden and tragic loss was most keenly felt by all. As a mark of sympathy the members stood silently in their places.

The Past-President's Medal was presented to Mr. Bernard Clarke, of Stamford, by the President, who tendered his sincere thanks for the manner in which he conducted the



A pleasant corner of the Bracebridge (Lincoln) Gas-Works.

affairs of the Association during his year of office. Mr. Clarke assured the members that he would always look back with pleasure upon his term as President.

The resignation on account of ill-health was announced of Mr. A. W. Sumner, of Ipswich. Though the Committee regretted this, they felt that they must accept the resignation, and express the hope that Mr. Sumner's health would improve. He was President of the Association in 1921.

The Committee had also considered the case of an associate member who had left the profession, and they had decided that he was no longer eligible.

Mr. Stanley F. Gardiner, Manager of the Witham (Essex) Gas Light and Coke Company, and Mr. W. E. Stephenson, Gas-Works, East Dereham, were elected members of the Association; and the following were elected associate members: Mr. James Simpson, London; Mr. James H. Kemp, Lymn; Mr. George J. Clarke, Lincoln; Mr. E. W. King, Elland; Mr. D. S. Glover, Sutton; and Mr. M. H. Thornton, London.

The Committee's report and the statement of accounts were adopted on the proposition of Mr. F. G. Brockway (Cleethorpes), seconded by Mr. S. Hands (Sleaford). The balance in hand at the end of last year amounted to £139 18s. 10d. The Committee had decided to make a donation of two guineas to the Drohan Fund. The amount at the credit of the President's Benevolent Fund at Dec. 31 was £131 15s. A further sum of £25 had been invested in the Abbey Road Building Society, and arrangements had been made for the interest on the invested capital in this Society to be credited in future to the capital account, instead of being merged in the general funds of the Association.

The President said that hitherto it had been the custom to recommend that a grant of £5 5s. be made to the Benevolent Fund of The Institution of Gas Engineers, but on this occasion the Committee felt that they would rather leave the question of the amount to be decided by the members. Mr. P. D. Walmsley (Great Yarmouth) remarked that it was a worthy cause, and in view of the balance in hand they might increase the contribution to an amount to be fixed by the Committee. Mr. J. H. Troughton (Newmarket) agreed that they seemed to be accumulating a fairly large sum, and if they had no calls a larger contribution to the Institution Benevolent Fund might be considered. Proposed by Mr. R. G. Shadbolt (Birmingham), and seconded by Mr. Walmsley, it was agreed that on this occasion a sum of £10 10s. be donated.

Education and Adequate Text Books.

The Eastern District Education Committee's Report was next presented by Mr. E. F. Keable (Gorleston), the Hon. Secretary to the scheme.

This stated that, as in former years, students had taken advantage of the Committee's guidance and help, and arrangements had been made for students from a number of centres to take the 1936 Institution examinations. Gas-fitting classes had again been well attended at the following centres: Cambridge; Colchester and Brightlingsea; Great Yarmouth; Lowestoft and Gorleston; Ipswich and Felixstowe; Norwich; Newark; and Grimsby and Cleethorpes—total students 109, which was an increase of 43 on the previous year. Grimsby and Cleethorpes were the latest additions to the gas-fitting centres, and special thanks were due to Col. J. Kennington and the Principal of the Grimsby Technical College for having made this possible. A number of gas-fitting students were in the fifth or final grade, having pursued their studies over the full course. The report continued in the following terms:

The Committee desire once more to record their appreciation of the fine work done by the tutors of these classes, and are indebted to the Board of Education for the short courses for teachers which were again held, the gas undertakings which have made the training possible, and encouragement given by prize awards, and the Education Authorities in the cities and towns named for their continued and valued co-operation. Thanks are also due to the Engineers of Cambridge, Colchester, Great Yarmouth, Ipswich, Lincoln, Norwich, and Lowestoft for having furnished competent examiners for the practical gas-fitting examinations. The Committee express the hope that the efforts put forward by the students will be suitably rewarded when promotions are under consideration.

The number of students taking the Domestic Gas Salesmanship Course of the British Commercial Gas Association, and examined during the session under review, was as follows: Norwich, 10; Bedford, 2; Stowmarket, 1; Ely, 1; and Gorleston, 1—Total 15. It is gratifying to note that four of these students were awarded distinction—Bedford 2, Norwich 1, and Gorleston 1. In organizing the examination centres the Committee again had the ready services of the engineers, who arranged for the examinations to be held on their premises and provided suitable supervisers. As an Industry, we should not rest until every available salesman is qualified by this valuable course, in view of the ever-increasing competition which we are facing.

Commenting upon the report, Mr. Keable said that a year ago Mr. W. W. Townsend had made a point as to what they could do to help students who were unable to obtain the necessary books for their studies. At the time, he (Mr. Keable) had replied that if anyone approached him he would do what he could. One student had done so, and he was able to assist him in the matter. If there were any other engineers in the room who knew young men in need of such assistance they might communicate with him.

Proceeding, Mr. Keable said that the Committee kept fairly close watch on the type of books that were used in schools, and he quoted one example which showed the necessity for so doing. By getting in touch with the whole of the educational authorities in their district, they were making an effort to replace out-of-date information with something adequate to the needs of the situation. They had arranged for a suitable leaflet to be distributed, and would be glad to hear of any cases that called for attention. It was vital that the schoolchildren should be properly instructed on the subject of gas, because they would be the Industry's future consumers. He hoped each member would take every opportunity of keeping gas right in the forefront in the schools.

Proposing the adoption of the report and a vote of thanks to Mr. Keable for his services, Mr. C. E. Byrt (Gainsborough) said it was only right that they should express their appreciation of the good work that had been done. The resolution was seconded by Colonel J. Kennington (Great Grimsby), who expressed pleasure at the progress being made in the matter of education, and remarked that the Association were fortunate in that this important subject was in the hands of so capable a gas educationist as Mr. Keable.

The next item on the agenda was the Presidential Address (which will be found on other pages of this issue), and after its presentation Mr. Wright was heartily thanked, on the proposition of Mr. WALMSLEY, seconded by Mr. C. FOWLER (Leiston). Mr. Walmsley said that no one could go over the Bracebridge Gas-Works without being greatly impressed by the immense amount of work that had been done by the President in his comparatively short term in charge of the Lincoln undertaking.

Designation of the Association.

When speaking at the luncheon earlier in the day, the President had made reference to the fact that the Association was founded in 1888, when competition was practically unknown, and when methods were mainly rule-of-thumb, whereas to-day people had the benefit of the results of the trials and tribulations of those who went before—the pioneers of a great Industry. The changed conditions of the times made it desirable that the Association should be described as one of "Engineers and Managers," for the duties of the manager had become greatly broadened. Formally introducing the subject at the meeting, the President moved that this change in title be made. Mr. Troughton seconded, with the remark that it was a step in the right direction, and Mr. Shadbolt supported, because it was simply recording what was taking place. The proposal was unanimously adopted.

For the next meeting of the Association it was decided to accept an invitation to visit the Staveley Coal and Iron Company's chemical plant.

Industrial Lincoln.

After tea an interesting hour was spent in the Guildhall, where the valuable collection of civic insignia was laid out for inspection, and described by a Corporation official; and in the evening the annual dinner of the Association took place in the County Assembly Rooms, followed by a dance—a thoroughly enjoyable function, which fittingly concluded a memorable day.

Thursday was devoted to a series of visits to works which revealed the importance of Lincoln's industrial activities and of the part played by the Gas Industry. Mr. Wright has been very busy in this connection, and for over two years has been endeavouring to secure the industrial furnace load—and, consequent upon the far-sighted policy in the matter of prices adopted by the Gas Committee and the City Council, notable success has attended his efforts.

The first visit was to the Smith-Clayton Forge Works, where members were enabled to learn a good deal with regard to the advantages of industrial gas furnaces in connection with general forging. The work done here is particularly on motor car axles and aero engine parts. So satisfactory has the experience been that it is intended to convert the whole of the factory to gas firing, when there will be 36 gas furnaces in operation, with a total gas consumption of over 150 million cu.ft. per annum. Such a scheme, of course, has been rendered possible only by specially attractive rates of charge.

At the works of Ruston-Bucyrus, Ltd., acquaintance was made with excavating machinery of all types—much of it astonishing in its magnitude. Among others, appliances for excavating trenches were seen. Subsequently this firm and Messrs. Ruston & Hornsby, Ltd., entertained the

members at luncheon in the Saracen's Head Hotel. Mr. G. R. Sharpley, Managing Director of Ruston & Hornsby, and Mr. V. Bone, representing Ruston-Bucyrus, acting as hosts. The firms were heartily thanked for their hospitality, on the proposition of the President, seconded by Mr. Keable.

Gas Engine's Come Back.

Returning thanks, Mr. Sharpley said it was recognized that the gas engine had for some time been rather "out in the cold," but there were definite signs of its coming back again. With gas selling at between 1s. and 1s. 6d. per 1,000 cu.ft., he believed that, if energetically pushed, a great many gas engines might be sold. His firm would be glad to assist in this. They were, in fact, putting themselves in a position to do so.

During the afternoon's visit to the Ruston & Hornsby boiler shops the members were struck by the versatile character of the work carried on there, as well as by the big proportions of the shop. Included in the work in hand were Woodall-Duckham waste-heat boilers for various gas-works, and a considerable amount of apparatus for Humphreys & Glasgow water gas installations. There was a Ruston-Hornsby 4½ H.P. gas engine, and there was also in operation a two-man power gas engine of the "Bisschop" type, manufactured in 1878. Of the latter class—having no compression and with flame ignition—2,510 engines were made at Stockport between 1878 and 1893.

North of England

Annual Meeting in Newcastle

Gas Managers' Association

The Annual Meeting of the North of England Gas Managers' Association was held in the Gas Offices, Newcastle-upon-Tyne, on Friday, May 8.

Prior to the meeting, a luncheon was held at the County Hotel, Newcastle, Mr. W. M. GALLEWAY, Whitby, the retiring President, occupying the chair. He later presided at the meeting when two new members were announced: Messrs. A. G. Anderson and G. Hudson. Following the practice of previous years, it was decided to make a donation of £10 10s. to the Benevolent Fund of The Institution of Gas Engineers.

The PRESIDENT, introducing Prof. J. W. Cobb, C.B.E., B.Sc., F.I.C., said that Professor Cobb's work for the Gas Industry was well-known, particularly his activities in training the rising generation of aspirants to honours in the Industry.

Prof. Cobb then delivered his lecture, entitled "Furnace Atmospheres and their Effects," which will be dealt with in a subsequent issue of the "JOURNAL."

Vote of Thanks.

Mr. C. DRU DRURY (Sunderland), proposing a vote of thanks to Prof. Cobb, said that the name of Cobb was indeed a household word in the Gas Industry. The lecture they had heard merited the closest study. His work in connection with fuel was familiar to all gas engineers, while his investigation into scaling pointed the way by which losses in that direction could be reduced. During the war, his work at the Ministry of Munitions brought immediate recognition. In education, those in the Industry knew personally of the work which Prof. Cobb conducted at Leeds University.

Mr. J. E. BLUNDELL (Carlisle) seconding the vote, said that it had been his privilege to have visited Leeds University and seen the work going on there. He had been 43 years in the Gas Industry and was in a position to realize the excellent facilities available to-day to the young men eager to make names for themselves in the Industry. The facilities were much greater than when he entered the Industry. He had every faith in the young men coming forward, but he did beg of them to take advantage of the educational facilities now available through the Education Scheme of the Association and elsewhere. There were so many candidates for the most attractive positions in the Industry that the advantage of sound educational training was bound to tell.

The vote of thanks was carried with acclamation. Responding, Prof. COBB thanked the gathering for their expression of appreciation and said he quite agreed with what Mr. Blundell had said. As to the future of the Gas Industry, he thought an endeavour should be made for everybody to provide themselves with a new mental equipment. That applied particularly to the young members. That equipment was nowadays readily available and if he mentioned that Leeds University was one of the places which could provide that equipment no one could blame him.

Mr. Thomas Hardie, a Director of the Gas Light and Coke Company, was elected an Hon. Member of the Association. Moving his election, the PRESIDENT said that Mr. Hardie's work for the Association was well remembered by the older members, while his work for the Industry was familiar to all. The Association had only one other Hon. Member—viz., Mr. Herbert Lees (Hexham)—and in electing Mr. Hardie, the Association honoured itself in honouring him.

Mr. HARDIE was unable to be present, but in a letter of apology for absence, he expressed his "sincere appreciation of this further honour by my friends of the North of England Gas Managers' Association."

New Officers and Committee.

The following officers were elected for the ensuing year:

President.—J. Corrigan (Brighouse).
Vice-President.—J. T. Dunn (Newcastle).
Hon. Secretary and Treasurer.—H. D. Lees (Hexham).
Hon. Auditor.—A. Pickering (South Shields).
Committee.—T. Law (Malton), B. Calvert (Northallerton), and J. R. Porter (Jarrow).

Congratulating Mr. Corrigan on his election, the RETIRING PRESIDENT said that he was pleased that the outlying districts were so well represented in, and acknowledged by, the Association. Responding, Mr. CORRIGAN said that his election was an honour to that section of the Association which, simply because of geographical position, was unable to make close contact with fellow members. He was, perhaps, one of the youngest members to be elected to the chair, and it was an indication of the willingness of young members to share the responsibilities of the Association.

It was decided that in future the District Member on the Council of The Institution of Gas Engineers be elected for a period of three years, and Mr. W. W. Atley, Stockton-on-Tees, was duly elected.

The PRESIDENT-ELECT presented on behalf of the members the retiring President with a framed Presidential Certificate to mark his year of office. In reply, Mr. GALLEWAY said he had seen many changes in the 44 years he had spent in the Industry. He had had a happy year. Curiously, his son had occupied the Presidential Chair of the Northern Area Gas Salesmen's Circle. In spite of, or because of, competition, the Industry had made great progress, and he felt sure that as an Industry, the best was still before them. Prospects were good, and it was up to them to go out and get the business he felt was awaiting. New times required new methods. The Industry was going forward to give its consumers the greatest service at the cheapest possible rate.

Mr. H. LEES proposed and Mr. W. C. PEEBLES (Edinburgh) seconded a vote of thanks to the President, Committee, and Officers, which was heartily accorded. The meeting concluded with tea at the County Hotel.

Midland Association of Gas Engineers and Managers

Spring Meeting at Northampton.

The Spring Meeting of the Midland Association of Gas Engineers and Managers was held in Northampton on Thursday last under the Presidency of Lt.-Colonel G. S. Eunson, D.L., Managing Director of the Northampton Gaslight Company.

The Works Inspected.

Members of the Association, turning up in force, assembled at the Gas-Works at 11.30 and made a most interesting tour of inspection.

The Northampton Gas-Works are situated on the south-west side of the town, adjoining the L.M.S. Railway.

The original Works were built on a portion of this site, and gas was first supplied to the town in 1824. These original Works occupied about half an acre of land. The present Works extend over an area of approximately 33 acres. It is interesting to note that a portion of the original retort house was pulled down only last year to make room for the new district governor house which has recently been completed.

The Works are divided into two portions, the old portion being situated on the north side of the river, and the new portion, which was commenced in 1888, on the south side of the river.

Previous to 1913 there were six retort houses. These houses were equipped with horizontal retorts in settings of eights, and were, with the exception of one house, all hand-charged. It was then decided to equip No. 5 house with vertical retorts, and the first installation was completed in 1913. A second installation of four settings was placed in the same house in 1917. A third installation was built in 1923 in No. 6 retort house, and in 1927 a fourth installation was added in this house.

The old horizontal retorts have now all been dismantled and the buildings used for other purposes.

Carbonizing Plant.

The whole of the gas is now produced by Glover-West continuous vertical retorts, which have a total capacity of 6 million cu.ft. per day.

Coal is received into the Works in railway wagons from the Company's private siding, the wagons being taken to the coal receiving hoppers, over which they are tipped, these hoppers discharging into breaking plant, after which it is handled by elevators and conveyors which in turn convey the coal to the overhead hoppers situated above the retorts.

These conveying plants have a capacity of 50 and 70 tons respectively of coal per hour. The overhead storage hoppers have a capacity of 24 hours' supply.

The coke on being discharged from the retorts is conveyed from the retort house to the coke screening plant. These conveyors have a capacity of 40 tons per hour.

Waste-heat boilers of the Galloway pot still type are situated on the top of the retort bench at the end of the waste gas flues of each setting.

The coke screening plants consist of ferro-concrete storage hoppers over which are placed finger screens of the reciprocating type, producing four grades of coke. The storage hoppers have a total capacity of 60 tons each, and discharge into railway wagons.

Practically all coal and coke is stored in the open, the coal in stacks of 1,000 tons, twelve to thirteen thousand tons being held in stock at normal times.

There are three steam-driven sets of exhausters each of 50,000 cu.ft. per hour capacity on the old Works, and three of 100,000 cu.ft. per hour capacity on the new Works.

Livesey washers and ordinary tower scrubbers are installed on both Works, a Field washer scrubber being used for extracting the last traces of ammonia. Steam heat exchangers are fixed on the inlet of each set of purifiers. There are six sets altogether, each consisting of four boxes.

There are six holders on the Works, five column guided and one of the spiral type, the six having a total capacity of 5½ million cu.ft. There are also twelve small district holders which are supplied at low pressure from the Works.

Gas Drying Plant.

Two calcium chloride gas drying plants are installed, one on each of the main district governor inlets. One plant is of the vertical tower type and the other the washer scrubber type. They have a total capacity of 450,000 cu.ft. per hour and are capable of drying the whole of the gas at times of peak load.

A new governor house has been completed this year, equipped with four new Peebles station governors, space and connections being left for two additional governors when required.

Two steam-driven compressors, having a total capacity of 120,000 cu.ft. per hour at 100 in. pressure, are installed for boosting up the pressure on two low points on the district. There is also a small plant in duplicate for high-pressure street lighting, having a capacity of 8,000 cu.ft. per hour.

Boiler plant consists of six Lancashire and two Babcock & Wilcox water tube boilers, together with the waste-heat boilers on the vertical retort installations.

The Works are equipped with loco-repair, engine fitting, and machine shops, smithies, joinery, and railway wagon building and repair shops, garage, laboratories, stores, &c.

The showrooms, offices, and workshops were erected in 1908-1910 and consist of general and executive offices, showrooms, demonstration hall, stove and meter repair shops, tinsmiths, paint and lamp repair shops, and stores. Additional warehouses and stores are at present in course of erection.

In addition to the Borough of Northampton, the Company also supplies thirty-eight villages—a total of 35,020 consumers—the area of supply being 200 square miles. A considerable number of villages have yet to be connected up. The supply system is low pressure with small district storage holders to maintain peak load consumption.

The inspection completed, a group photograph was taken, and the visitors were then transported to the Town Hall, where they were the guests at luncheon of the Chairman (Mr. Frederick Bostock) and Directors of the Company.

Luncheon.

The Mayor (Councillor S. Perkins), replying to the toast of the Town and Trade, which had been ably proposed by Mr. H. Pooley, said the Northampton Gas Company was one of the finest concerns of its kind in the Kingdom. Its success was due to a very great extent to the loyalty and outstanding abilities of its staff and the enterprise of the Directors. He heartily congratulated them upon their consistent progress, and desired specially to mention Mr. Harry Banks, the Engineer. They were at school together, and he had watched Mr. Banks' career from boyhood with ever-increasing delight over his success in life.

Mr. F. Bostock, Chairman of the Company, in proposing the toast of the Association, also welcomed the Mayor and members of the Corporation, remarking that the relations between the Company and the Town and County Authorities had always been of a pleasant character. He noticed that the Midland Association of Gas Engineers and Managers was founded in 1878. Eminent men had held the Presidency, and they had an eminent person to-day in Colonel Eunson, whose family had been associated with the Northampton Gaslight Company for the last 90 years. The father of Colonel Eunson served the Company for 57 years and was thought so highly of that

he was made a magistrate at the age of 77. The Company was now well over one hundred years old, and it was a great joy to him to be its Chairman. His own business (the Lotus Shoe Company) was also over one hundred years old, and that period covered the association with it of his father and himself. He had been a Director of the Gas Company for 29 years and Chairman for 18 years. The policy of the Directors had always been one of progress, and he thought that after their inspection that day the visitors would agree that their works were up-to-date. [Hear, hear.] He recalled that when the Gas Company was first formed, some members of the Corporation had a pleasant informal meeting with the Directors, thinking it might be a good thing for the town to take it over. They had drinks together at the end, and the members of the Corporation seemed to have come to the conclusion that the Directors of the day were a jolly good lot and that the Industry might safely be left in their hands. It was a great pleasure to himself and his co-Directors to entertain the Association, and he hoped they would retain pleasant memories of their visit.

Col. EUNSON, replying, referred to his position as rather Gilbertian because of his dual capacity as President of the Association and Managing Director of the Northampton Gas Company whose Directors were so hospitably entertaining them that day. He added that when he was appointed President, his co-Directors went wholeheartedly into arranging to entertain them, and they felt very pleased and honoured that so many members of the Association had responded to the invitations. Although their Gas Institution met in London twice a year to discuss things taking place or about to take place in the Gas Industry, much of the spade work was done by the District Associations. There was no District Association that had done better work than the Midland. It might be said that they centred on Birmingham—practically the cradle of the Industry—whose undertaking had done everything they could to further the Industry, and had also extended much kindly help to smaller gas concerns. He had tried to get together for their re-union that day as many pupils of his late father at Northampton Gas-Works as he possibly could; and there were among them Mr. T. E. Maddocks, of Kettering, and Mr. G. Ruggles, of Leighton Buzzard. Mr. Potter (late Engineer at Shanghai) and Mr. John Bingley had been unable to attend. He regretted, as they all did, that among the apologies for inability to attend was one from Col. Carr, President of The Institution of Gas Engineers, who would have been with them but for the fact that two other District Associations were holding their meetings at the same time.

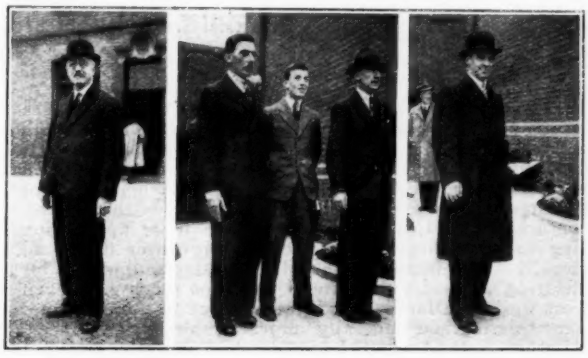
Proceeding, the President caused much amusement by recalling the circumstances surrounding the formation of the Northampton Gas Company in 1823. He said it was really started by an enterprising body of citizens, all of whom were members of the Town Council. They swiftly realized there was something good coming along, and put their money into it. That was not without its humorous side. They had no office, so the first meeting of the Directors was held in a room at the Town Hall. [Laughter.] No sooner was the Company formed than there arose in the Council Chamber the question of lighting the town by gas. [Renewed laughter.] The Corporation asked the Gas Company to quote a price, and the Directors of the Gas Company, meeting again at the Town Hall, fixed a price. When the Council met again to consider the quotation, the members, feeling that they had a duty to the ratepayers, categorically replied that they would see the Directors of the Gas Company hanged before they consented to such terms. The argument went on for some time until at length the then Town Clerk and the Secretary to the Gas Company came to terms; and the relations of the Company with the Municipal Authorities had been of the happiest character ever since.

Gas Companies and Miners' Pay.

Turning to the difficulties that lay ahead of the Gas Industry, the President said that a hard twelve months was before them. Not long ago all gas undertakings were asked to pay a voluntary additional sum to the collieries for better pay for the miners. They all felt that if anybody ought to be paid better, it was the miner; and consequently they all agreed. But directly they had done that, which they all felt was an easy and reasonable thing, the collieries suggested the payment of another 1s. or 1s. 6d. on new contracts. This he believed was backed by the Government. "That is all very well, and we don't mind," added the President, "if that extra money is going to help the miner; but they don't say it is in this case. We have been trying for many years to get down the price of gas to the consumer because we consider the consumer has a certain call upon us, and we want to sell it at the lowest price possible." [Hear, hear.] Directly any real progress towards that end was made, said the speaker, somebody always came down upon them; in which connection he referred to railway rates having been only slightly reduced from their war-time level. Gas concerns like theirs in the Midlands were in the worst possible position in regard to their coal transport facilities, for they could only get their supplies by rail. Road transport was out of the question, and, unlike places in the south of England, for example, they could not call seaborne traffic to their aid.

A Presentation.

The President then announced that he had the pleasant duty of making a presentation to Mr. S. J. Sadler, of



A Crowded Day for the Managing-Director, Engineer, Secretary, and Staff of the Northampton Gaslight Company.

Solihull, in recognition of his devoted work as Hon. Secretary for the past four years. So many people seemed to think that the post of Hon. Secretary was a mere sinecure; it had not been so in this case, for Mr. Sadler had put in a tremendous amount of work. They asked him to accept in grateful recognition a canteen of cutlery in the hope that he might live many years to use it. If there was any superstitious fear that the gift of cutlery might tend to cut their love, he would suggest as a safeguard that Mr. Sadler

should give one halfpenny not to each subscriber but to his successor, Mr. J. H. Paterson, of Ludlow. [Applause.]

In acknowledgment, Mr. Sadler said no words of his could adequately express his great appreciation of their handsome gift and the good wishes accompanying it. His work for the Association had been a labour of love, and he trusted he might be able to do more for them. Their present would ever remind him of the very happy and harmonious way they had co-operated with him in all that he had attempted to achieve.

Visits.

For the afternoon a most enjoyable series of visits had been arranged. In the first place the large party was privileged to make a thorough inspection of the new Fire Station (opened in July, 1935). An alarm was given by the Chief and an engine turned out in about 20 seconds, an example of promptitude which so infected the visitors that numerous gas engineers (large and small) found it necessary to return to *terra firma* from the upper storeys by way of the firemen's gleaming "sliding poles." A demonstration at the practice tower followed, and then the party inspected the magnificent baths which are in course of construction next to the Fire Station. Finally there was a visit to the College of Technology, where hard-working members of the staff found time to conduct a thorough tour of these modern and excellently equipped premises.

At the subsequent tea in the Company's large Demonstration Hall, Mr. Harold Davies (Chesterfield) expressed hearty thanks to the Directors of the Northampton Company for their hospitality and assured them that the visit had been most enjoyable; Mr. Bostock renewed his assurance of the pleasure it had been to himself and his co-Directors to welcome the Association to Northampton.

YORKSHIRE INDUSTRIAL GAS DEVELOPMENT CENTRE

THE TESTING OF Gas-Fired Central Heating Boilers

by
E. A. LEASK,
Industrial Superintendent,
Leeds Gas Department

From a Paper read before members of the Yorkshire Industrial Gas Development Centre at Leeds on Wednesday, April 22

A possible method of testing is to treat the boiler as a calorimeter, ascertain the amount of water passing through the boiler and the water temperature, inlet and outlet. With this data, together with the rate of gas consumption and its calorific value, it would be a straightforward calculation to arrive at the heating efficiency of the boiler.

Unfortunately this method can have little application owing to the difficulty of measuring the water flow, and generally the introduction of special equipment for measuring the water flow would incur too much cost; even if cost was not a factor, the inconvenience to the consumer makes this method generally impracticable.

Another method which I am about to describe may not be as direct, but has the advantage of causing the minimum of inconvenience to the consumer while at the same time providing reasonably accurate data with regard to the performance of the boiler.

The method is based on the assumption that when gas is burned in a boiler the heat losses are confined to the waste gases leaving the boiler, and a knowledge of this loss together with the amount of heat being fed to the boiler, will provide the data necessary to make the calculation for efficiency. This is neglecting radiation losses from the boiler. For purposes of comparison it may be an advantage to have an efficiency figure which ignores radiation losses, as this item is controlled by the efficiency of the insulation, which it might be agreed should be considered separately.

The data necessary are:

(1) Temperature of the flue gases.
(2) Percentage of CO_2 and O_2 in the flue gases.
(3) Volume of CO_2 formed per unit volume of gas burned.
(4) Percentage of CO_2 in the "air free" products of combustion.
(5) Volume of "air free" waste gases per cubic foot of gas burned.
(6) Volume of excess air per cubic foot of gas burned.
(7) Sensible heat of air, waste gases, and latent heat of steam.

It is unnecessary to measure the quantity of gas supplied to the boiler.

Items 1 and 2 are obtained on testing the flue gases. A thermometer fitted into the flue pipe as near the boiler as possible will provide the temperature, and "Orsat" tests will give the CO_2 and O_2 figures. "Orsat" tests need to be taken with great care as serious errors can occur due to fluctuations of temperature in the water jacket, which influences the measurement of the gas in the burette.

Item 3 can best be obtained in the laboratory on a complete gas analysis apparatus by passing the gas over heated copper oxide and measuring the CO_2 formed. Item 4, by the analysis of a sample of products of combustion from a calorimeter, Argand burner, or any apparatus where complete combustion is assured, and making the necessary "air free" calculation.

Item 5 can be calculated from items 3 and 4.

Item 6 can be calculated from items 2, 4, and 5.

Item 7 is calculated from the information given in the 10th Report of The Institution of Gas Engineers, 1923.

No account has been taken of the original moisture present in the air and gas before combustion. This moisture would be additional to that formed in combustion, and would pass away with the products of combustion. Some heat loss is involved, but as the amount is something less than ½ B.Th.U. per cu.ft. of gas burned, it has been considered too small to justify the extra calculations involved, and is therefore omitted.

The particular gas under review requires 3·89 cu.ft. of air per cu.ft. of gas for complete combustion to give 3·62 cu.ft. of waste gases (independent of moisture).

It is better to ensure complete combustion by having a reasonable excess of air present than attempt to obtain a high CO_2 figure in the waste gases by unduly restricting the air required for combustion. This applies particularly to a central heating installation where the temperature of the products of combustion is comparatively low.

Data Used.

Products of combustion (air free, dry) per cu.ft. of gas burned	= 3·62 cu.ft.
Air required per cu ft. of gas for combustion	= 3·89 ,,
CO_2 formed per cu.ft. of gas burned	= 0·4742 ,,
CO_2 in (air free) products of combustion	= 13·1%
Moisture formed on burning 1 cu.ft. of gas	= 0·0439 lb.
Oxygen in air	= 20·93%

Latent and Sensible Heat of Gases.

Latent and sensible heat of water from 60° F. to steam at 212° F.	= 1,117 B.Th.U. per lb.
Sensible heat of steam above 100° C.	= 0·95 B.Th.U. per lb. per 1° C.
Sensible heat in waste gases	= 0·033 B.Th.U. per cu ft. per 1° C.
Sensible heat in air	= 0·032 B.Th U per cu.ft. per 1° C.

Flue Losses at x Temperature.

Per Cu.Ft. of Gas.

Latent and sensible heat of moisture formed to steam at 100° C.—
$0·0439 \times 1,117 =$ 49·04 B.Th.U.

Sensible heat of moisture formed (steam) above 100° C.—
$(x - 100) \times 0·95 \times 0·0439 = (x - 100)\, 0·417$ B.Th.U.

Sensible heat in waste gases (air free)—
$= (x - 15·5° \text{ C.}) \times 0·033 \times$ {Volume of gases per cu.ft. of gas burned.}

Sensible heat in excess air per cu.ft. of gas burned—
$= (x - 15·5° \text{ C.}) \times 0·323 \times$ {Cu.ft. of excess air per cu.ft. of gas.}

Complete combustion is assumed in the above calculations.

Example.

BONECOURT STEAM BOILER, QUEEN'S HOTEL.

Products box, 0·035 vacuum.
Analysis of waste gases—

CO_2 . . . . 10·6%
O_2 . . . . 1·1 ,,

Temperature of waste gases—153° C.
Volume of CO_2 in "air free" waste gases—

$$\frac{CO_2}{1 - 0{\cdot}0478\ O_2} = \frac{10{\cdot}6}{1 - 0{\cdot}0526} = 11{\cdot}19\%$$

As the CO_2 figure should be 13·1% it is evident that there is incomplete combustion.

Total volume of flue gases per cu.ft. of gas burned—

$$\frac{3{\cdot}62}{1{\cdot}355\ (1 - 0{\cdot}02\ CO_2 - 0{\cdot}0478\ O_2)} = \frac{3{\cdot}62}{1{\cdot}355\ (1 - 0{\cdot}212 - 0{\cdot}526)} = 3{\cdot}63$$

Volume of excess air per cu.ft. of gas burned—

$$\frac{0{\cdot}1277\ O_2}{1 - 0{\cdot}02\ CO_2 - 0{\cdot}0478\ O_2} = \frac{0{\cdot}14}{1 - 0{\cdot}212 - 0{\cdot}0526} = 0{\cdot}20$$

Volume of CO in waste gases per cu.ft. of gas burned –

$$\frac{3{\cdot}62\ (0{\cdot}131 - 0{\cdot}006\ O_2 - 0{\cdot}01\ CO_2)}{1 - 0{\cdot}0478\ O_2 - 0{\cdot}02\ CO_2} = \frac{3{\cdot}62\ (0{\cdot}131 - 0{\cdot}006 - 0{\cdot}106)}{1 - 0{\cdot}212 - 0{\cdot}0526} = 0{\cdot}09$$

Heat losses per cu.ft. of gas burned—

Moisture formed on combustion—
Latent and sensible heat at 100° C. . . . . = 49·04
Sensible heat (100° C. to 153° C.)—
0·0439 × 53 × 0·93 . . . . . = 2·2
Waste gases including CO, *air free*—
3·43 × 153 × 0·033 . . . . . = 17·37
Excess air—
0·2 × 153 × 0·0323 . . . . . = 0·93
Potential heat in 0·05 cu.ft. of CO—
0 09 × 320 . . . . . = 28·8

Total B.Th.U. . . . = 98·34

Flue losses, 20·9%

Equations.

(1) Percentage CO_2 in air free products of combustion (complete or incomplete combustion)

$$= \frac{CO_2}{1 - 0{\cdot}0478\ O_2}$$

CO_2 = % CO_2 in waste gases
O_2 = % O_2 ,,

(2) Air free waste gases per cu.ft. of gas burned (complete combustion only)

$$= \frac{47{\cdot}42 - 2{\cdot}266\ O_2}{CO_2}$$

CO_2 = % CO_2 in waste gases
O_2 = % O_2 ,,

(3) Air free waste gases per cu.ft. of gas burned

$$= \frac{3{\cdot}62}{1{\cdot}355\ (1 - 0{\cdot}02\ CO_2)}$$

CO_2 = % CO_2 in air free waste gases.
This equation can be used in the presence of CO in waste gases.

(4) Volume of combustion products per cu.ft. of gas burned (complete or incomplete combustion)

$$= \frac{3{\cdot}62}{1{\cdot}355\ (1 - 0{\cdot}02\ CO_2 - 0{\cdot}0407\ O_2)}$$

CO_2 = % CO_2 in flue products.

(5) Air necessary for complete combustion of 1 cu ft. of gas

$$= \frac{59{\cdot}98 - 2{\cdot}866\ O_2 - 0{\cdot}688\ CO_2}{CO_2}$$

CO_2 = % CO_2 in waste gases
O_2 = % O_2 ,,

(6) Carbon monoxide — percentage in air free waste gases

$$= (13{\cdot}1 - CO_2)\ 1{\cdot}355$$

CO_2 = % CO_2 in air free waste gases.

(7) Carbon monoxide — cu.ft. in waste gases per cu ft. of gas burned

$$= \frac{3{\cdot}62\ (0{\cdot}131 - 0{\cdot}01\ CO_2)}{1 - 0{\cdot}02\ CO_2}$$

CO_2 = % CO_2 in air free gases.

(8) Carbon monoxide — cu.ft. in waste gases per cu.ft. of gas burned

$$= \frac{3{\cdot}62\ (0{\cdot}131 - 0{\cdot}006\ O_2 - 0{\cdot}01\ CO_2)}{1 - 0{\cdot}0478\ O_2 - 0{\cdot}02\ CO_2}$$

CO_2 = % CO_2 in flue products.

(9) Volume of excess air in products of combustion per cu.ft. of gas burned (complete or incomplete combustion)

$$= \frac{0{\cdot}1277\ O_2}{1 - 0{\cdot}02\ CO_2 - 0{\cdot}0478\ O_2}$$

CO_2 = % CO_2 in flue gases
O_2 = % O_2 ,,

(10) Carbon monoxide — percentage in waste gases

$$= 1{\cdot}355\ (13{\cdot}1 - 0{\cdot}626\ O_2 - CO_2)$$

CO_2 = % CO_2 in flue gases
O_2 = % O_2 ,,

For High-pressure Gas Mains

THE Stanton-Wilson Self-adjusting Pipe-joint enables gas mains to withstand ground subsidence and traffic vibration. Being leaktight under pressure, it is particularly suitable for mains in gas supply systems. Well over 300,000 Stanton-Wilson Joints are now actually in service.

Stanton-Wilson Joints are available with Stanton "New" Spun Iron Pipes in diameters ranging from 3 inches to 15 inches.

These pipes are centrifugally cast without chill by a patented process which increases their impact resistance to beyond anything obtainable with the thicker sand-cast pipe. Gas cannot percolate through the dense, non-porous structure of the "New" spun metal.

STANTON "NEW" SPUN IRON PIPE -WILSON SELF-ADJUSTING JOINT

The Stanton Ironworks Company Limited, Near Nottingham

EASTERN COUNTIES GAS MANAGERS' ASSOCIATION

THE PRESIDENT.

Presidential Address

OF

G. WRIGHT

(Engineer and Manager of the City of Lincoln Gas Department)

Presented at the Spring General Meeting of the Association held at Lincoln on May 6 and 7, 1936.

"The History and Development of Gas Supply in Lincoln"

The manufacture of gas in Lincoln first commenced at Newland Works in 1830 under the auspices of the Lincoln Gas Light and Coke Company, Ltd. The capital consisted of £8,000 in shares, and £1,800 mortgage. The total receipts for the first year were £1,515, and the net result a loss of £330. Wages paid amounted to £436 per annum. The number of street lamps was 76.

The price of gas at the time was 13s. 6d. per 1,000 cu.ft. By 1853 the price had been gradually reduced to 5s. per 1,000 cu.ft., when the amount of gas made was 15 million cu.ft. The Bracebridge Gas-Works were opened in 1876.

In 1885, the Gas Undertaking was purchased from the Company by the Lincoln Corporation, when the manufacture of gas had been increased to 163 million cu.ft., the number of consumers being 5,789, and the length of main 35 miles.

In 1913 the price of gas in the City reached its lowest figure—namely, 2s. per 1,000 cu.ft.

In 1919 it was thought advisable to appoint a Distribution and Showroom Superintendent.

In 1929 it was deemed a wise policy to close the showrooms in Saltergate and to open larger and more commodious premises on the present site in Silver Street, a policy which has been amply justified.

It is interesting to note that since 1853 to the present time there have only been four Managers of the Undertaking. Mr. W. P. Throsby was Manager from 1853 to 1880. Mr. John Carter was appointed Secretary in February, 1881, and Manager in 1884 until 1915, and was President of your Association. Mr. Mainwaring, who had been Assistant for many years, secured the position in 1915, which he retained until his retirement in March, 1930. Incidentally, Mr. Mainwaring rendered good service as Secretary and Treasurer of the Eastern Counties Gas Managers' Association for 7 years, and I am pleased to say he is still an Honorary Member.

It will thus be seen that Mr. Mainwaring had to carry on through a most difficult period of war and strikes, when the resources of the Department were strained to their utmost to keep the gas supply intact.

It was decided to appoint an Engineer and Manager, and I was appointed to the dual post. At the same time Councillor A. L. Bower succeeded the late Alderman Wallis in the Chairmanship of the Gas Committee.

The gas storage capacity at the Works had for some time been a cause for real anxiety, only 12 hours' storage being available, which left a very narrow margin upon which to rely in case of any hold-up on the manufacturing plant. Various types of holders were inspected, both in this country and on the Continent. A new holder was ordered on Sept. 25, 1930, and was of the three-lift spirally-guided type. 1½ million cu.ft. in capacity, with a steel tank on reinforced concrete foundations. The total weight of the steelwork is 956 tons.

The late Alderman Wallis, J.P., was Chairman of the Gas Committee for 30 years, until his death in January, 1930. and it will have been gathered that during that time the Department continued to make satisfactory progress. It was his laudable ambition to hand over the Gas-Works to the Corporation, free of any debt.

The carbonizing plant at that time consisted of horizontal retorts, machine charged at the Bracebridge Works, augmented by water gas, and horizontal retorts, hand charged at the Newland Works.

However, in view of the serious nature of unemployment in the City, the Council in 1931 asked the officials to put forward schemes which would help to relieve the situation. As Engineer, I put forward a scheme for the complete reconstruction of the Works, which would be calculated to employ a large number of men on the site and, what was equally important, find work for the local firms. Also when completed the scheme would be revenue producing, so much so that when it came under consideration for a Government Unemployment Grant, it was soon pointed out that the savings stated made it sufficiently attractive for the Corporation to carry it out on their own responsibility.

Eventually it was possible to convince the Government Department concerned that, as in the ordinary way the scheme would not have been proceeded with until 1935 when the loan on the old works expired, it was unfair for the Gas Department to be paying interest until that time on two loans. They therefore agreed to assist with the interest until 1935, and the City Council decided that the scheme should be put in hand.

Specifications and drawings were prepared and tenders called for, one stipulation being that any work which could, in the opinion of the engineer, be done on a competitive basis in Lincoln was to be placed with local firms, in consequence the majority of the steel and ironwork, castings, engines, boilers, &c., were made in Lincoln. The scheme included not only a new retort installation, but complete new exhausters, tar extractors, washers, purifiers, tar and liquor pits, gas mains, tar and liquor mains, gas governors, and station meter.

After careful consideration of a number of different available systems it was decided to install the Woodall-Duckham system, which gives a large output of gas per square foot of ground space, high yields of gas per ton of coal, and low fuel consumption; also there is simplicity in the construction and operation, and ample strength and stability to meet all needs.

The following new plant was installed:

Continuous vertical retort installation and coal and coke handling plant.

Condensers, Livesey washers, tar extractor, purifiers, oxide handling plant, steel purifier house roof, gas heater, tar and liquor separating tanks, overhead gas mains, and valves.

Rotary washer, Connersville exhausters and boosters, Connersville meter.

Station governor.

Overhead water storage tank. &c.

Foundations and buildings for purifier house, washer house, and exhauster house.

Work actively commenced on the site in the middle of January, 1932. The new gas-making plant, including the retort installation, purifiers, washers, &c., was put into operation at 3 a.m. on Oct. 10, 1932. Therefore, the major portion of the scheme was completed in ten months.

Woodall-Duckham Continuous Vertical Retorts.

General.—The retort installation consists of one bench containing twenty-four latest type upwardly-heated Woodall-Duckham continuous vertical retorts, capable of carbonizing 216 tons of coal and of producing 3,370,000 cu.ft. of gas a day. The retort bench is heated with hot gas from a battery of five producers and is provided with

duplicate waste-heat boilers, complete coal and coke handling plant, coke screening plant, and a coal and gas testing plant installed in conjunction with an isolated retort. The installation has been erected in a new steel-framed brick-panelled retort house, with the exception of the coke screening plant, and the old horizontal retort house has been converted into a coal and coke store complete with reclaiming plant.

Retorts.—The retorts are of the standard Woodall-Duckham upwardly-heated design, the vertical flue construction of which lends rigidity to the retort structure and facilitates inspection of the heats from one level. One of the makers' claims in connection with this design is that spalling of the silica is practically eliminated, and our experience has gone far to substantiate this claim.

Coal Supply to the Retorts.—The coal to be carbonized is discharged from railway wagons by means of a rotary tippler into a 12-ton coal receiving hopper. From this hopper it is fed at a rate of 45 tons per hour either through a breaker or a by-pass chute, to the boot of a bucket elevator. The elevator then delivers the coal on to the loop of an encircling lip bucket conveyor, which in turn discharges it into an overhead coal storage hopper of 48 hours' capacity. Hand-controlled rotary valves underneath the main coal storage hoppers govern the supply of coal to the auxiliary coal hoppers above each retort.

The travel of the coal through the retort is controlled by the well-known Woodall-Duckham helical type extractor which we have found to be readily adjustable and reliable in operation.

It is well known that with continuous vertical retorts there is a tendency for the ash liberated by steaming to attack the joints in the lower parts of the retorts where there is no protection by scurf formation. It has been our practice to make use of the provision made in the bottom castings for spraying the region where slagging is liable to occur, and in my opinion this routine work is well worth while from the point of view of brickwork maintenance costs.

Gas Offtakes and Collecting Mains.—The gas issues from the top of the retort through an offtake pipe situated at one end of the retort. The coal entering the retort is kept clear of this offtake pipe by means of a special deflecting plate, which allows ample space for the gas flow from the coal. The offtake pipe, which is of suitable area to ensure equalization of pressures and is so arranged as to be readily cleaned, leads the gas into a mushroom valve which is connected to the top of the collecting main, one of which is provided along each side of the bench. This valve provides for the closing off of the individual retort from the collecting main, when the retort is being scurfed or is let down cold.

The collecting mains are of the dry type, and as the gas passes through the offtake and the main, it is sprayed with hot ammoniacal liquor by means of a spray fitted into the top of the main beside each gas inlet. Each collecting main has a fall from each end towards the centre, at which is situated a cleaning well, where the heavy tar deposits collect and can easily be removed. This well is provided with a weir over which the liquor flows to a tar and liquor separating tank. In this tank the tar is deposited and rises over an adjustable weir, whence it flows to the tar well. The decanted liquor passes through screens into a separate compartment, from which it is pumped back to the sprays in the foul main. Two vertical direct-acting steam-driven pumps are provided for this purpose, one acting as a standby to the other.

In this manner there is constituted a closed ammoniacal liquor circuit, and a regular supply of hot liquor is ensured. The gas passes from the collecting mains through uptakes into a foul main where pull on the retorts is regulated by an " Arca " regulator.

Producers.—To supply the gas for heating the retorts a battery of five producers is provided at the retort house floor level at one side of the bench. The producers are arranged so that any one producer may be shut down without interfering in any way with the working of the other producers. The gas from any of the producers may be taken to the heating flues of any of the retorts. The producers are of the pressure operated step-grate type and are constructed with ample grate area for the efficient heating of the retorts when burning a mixture of coke and breeze as well as for burning the additional amount of fuel required for a supplementary supply of producer gas to the waste-heat boiler.

Waste Gas Flues and Waste-Heat Boiler.—The flow of waste gases from the combustion chambers of each retort is controlled by two dampers, one for each side of the retort. The waste gases from each group of four retorts pass into a common flue and out through a neck into the waste gas main. The necks and the main are formed of mild steel casings lined with firebrick.

The waste gas main conveys the gases either directly to a firebrick-lined steel chimney or to one of two waste-heat boilers which are provided for utilizing the major portion of the heat contained in the gases. The waste-heat boilers are of the horizontal fire-tube type, worked with induced draught by means of a turbine-driven waste gas fan provided at the outlet of each boiler to maintain the necessary draught for working the settings efficiently. The boilers are designed for a working pressure of 120 lbs. per sq.in., and each is of sufficient capacity to deal with the waste gases from the whole twenty-four retorts. One thus acts as a standby to the other.

In order that the boilers shall give their maximum output of steam irrespective of the number of retorts in operation, provision is made so that a supplementary supply of producer gas can be mixed with the waste gases before they are passed to the boiler, a supplementary combustion flue being provided.

The boiler is fitted with all the necessary steam and water mountings and fittings, including high and low water alarm.

A Neckar water softening plant has been installed to treat the feed water to the waste-heat boilers, and two single cylinder direct-acting steam-driven feed water pumps are installed, one acting as standby to the other.

Coke Handling, Storage, and Screening Plant.—The contents of the coke chambers beneath the retorts are discharged into the bottom strand of the overlapping bucket conveyor through a travelling filling chute, running on rails laid in the retort house floor.

Producer coke and scurfed coke is delivered into an overhead storage hopper arranged with chutes for feeding the producer charging skip and the retort filling skip. From an external loop of the lip bucket conveyor surplus coke is discharged either to the coke screening plant or by way of a reversible band conveyor into store in a section of the old horizontal retort house which has been completed for this purpose.

A system of band conveyors from the store enables coke to be returned to the screening plant as and when required. The coke screening is carried out by means of a " Grizzly " scalping screen, while subsequent grading is done by a rotary screen of ample diameter. The coke storage hoppers have a capacity of 100 tons of coke and are complete with chutes to road vehicles, to a concrete bagging platform and to a band conveyor for feeding railway wagons. Each chute is fitted with a " Static " de-breezing screen to ensure that a clean product is delivered to all users.

Coal Storage.—Coal is brought into the coal storage side of the horizontal retort house by means of the existing bucket elevator and push plate conveyor, which were used to supply the horizontal retorts. A system of underground band conveyors is used for re-claiming the coal from store to the breaker pit.

Gas and Coal Testing Plant.—A plant has been installed for testing gas and coal working in conjunction with one isolated retort contained in the bench. Coal is fed from a separate compartment, made by inserting division plates in the overhead storage hoppers, into the isolated retort, which is so arranged that it can be worked either separately from or in unison with the remaining retorts as required. One end of the collecting main on that side is isolated and provided with its own cleaning well, liquor circulating, and tar and liquor separating system, two uptakes, foul main, and " Arca " regulator. A vertical condenser of 145,000 cu.ft. per day capacity is provided in the corner of the retort house, while in an annexe to the retort house are provided a Connersville " Victor " gas exhauster, a P. & A. tar extractor, Livesey washer, and Connersville positive displacement meter.

Power and Steam Supply.—The electric motors are used for the coal and coke handling plant, all motors being of the totally-enclosed, dustproof type, of special design for use in gas-works. Two vertical slow-speed, non-condensing steam engines are provided to actuate the coke extractors, one acting as a standby. The induced draught fan for the waste-heat boiler is driven by means of a non-condensing steam turbine, direct coupled to the shaft, and the liquor pumps and feed water pump are also steam-driven.

The whole of the steam requirements for the retorts, producers, feed pump, fan turbines, extractor engines, and liquor pumps are supplied by the waste-heat boiler, while in the event of any additional steam being required for a special purpose, this can be obtained by means of augmentation from the producers direct to the inlet of either waste-heat boiler.

Ancillary Plant.

Water Tube Condensers.—The gas leaving the retort house is conveyed overhead in a 24 in. diameter mild steel welded main to a battery of water tube condensers situated outside the exhauster house. The condensers are of the vertical tube type in two units of cast-iron construction, each 7 ft. 6 in. by 6 ft. by 30 ft. high, having internal mild

steel baffles and weldless steel condensing tubes. Each unit may be worked independently or both together either in series or parallel. Provision has been made for extending the units without interfering with the working of the present installation.

Condensing water is provided from an elevated cast-iron tank over the exhauster house, capable of holding a supply of 35,000 gallons. All the valves, both gas and water, are conveniently grouped at the top of the condensers, and are operated from a chequered plate platform running alongside the condensers, and reached by means of a mild steel access ladder.

The condenser tubes are 2½ in. in diameter, secured into the cast-iron tube plates with cast-iron glands and stuffing boxes.

P. & A. Tar Extractor.—The tar extractor is of cast-iron 4 ft. in diameter by 10 ft. high. Inside the cylinder is suspended a balanced floating bell carrying the perforated basket for extracting the tar on the well-known wire drawing principle. The bell is counterbalanced, and the mechanism throughout is mounted on ball bearings. Visible tar overflows discharge into a 6 ft. deep seal pot into which various drains are also run. Cleaning doors are fitted enabling any portion of the apparatus to be inspected as required. The valves and connections are 24 in. in diameter arranged for by-passing the extractor if required, and provided with necessary branches to connect up to a future duplicate extractor.

Livesey Washer.—This apparatus, capable of dealing with 3 million cu.ft. of gas per day, consists of a cast-iron chamber 15 ft. by 7 ft. 6 in. by 3 ft. 6 in. inside, fitted with cast-iron hanging plates carrying 45 bubbling troughs. The liquor level in the washer is controlled by a 4-in. weir valve discharging through sealed anti-syphonic pipes, and the liquor level can be seen and adjusted through sight glasses fitted on both sides of the washer. Tar is drawn off through a 3 in. diameter plug cock from a tar sump fixed underneath the apparatus, and the liquor can be drained off by a 4 in. diameter sluice valve into the underground tar and liquor pipes.

Ammonia Washer.—The ammonia washer is an 8 ft. diameter patent Holmes rotary brush type in two units, arranged so that either or both may be by-passed, and designed to give ammonia liquor of maximum strength with economy in the use of water. The machine is driven by a horizontal steam engine through the medium of spur gearing.

Gas Heater.—The gas heater is inserted in the gas main between the rotary washer and the purifiers, with the object of heating the gas before entering the purifier boxes. Live steam is supplied from the waste-heat boilers, reduced down to 60 lb. per sq.in. Steam condensate is led to a steam trap and liquor drains into a 6 ft. deep seal pot and from thence into the underground liquor pipes.

Purifiers.—The purifying plant comprises five cast-iron boxes, each 40 ft. by 30 ft. by 6 ft. deep, on overhead staging 11 ft. above ground level. The boxes are in line, the first four working in rotation by means of three-way valves, and the fifth box as a catch box fitted with inlet, outlet, and by-pass slide valves. Four steel covers are provided to each box for openings 17 ft. by 12 ft., and are secured in position by ring nuts and eye bolts. The covers are handled by hand-operated lifting blocks running on joist runways suspended under the roof principal tiebars. Three tiers of grids carry the oxide, which is emptied through 18 in. diameter oxide chutes in the bottom plates of the boxes, to the revivifying floor beneath. The valves and connections run along one side of the boxes immediately under the chequered plate walkway, with the valve spindles and handwheels at a convenient height for operating. Access to the boxes is by a mild steel stairway.

Oxide Handling Plant.—This comprises an inclined elevator, enclosed in a mild steel casing, picking oxide from a concrete pit at one end of the purifier house and delivering on to an 18 in. band conveyor running the full length of the house. Oxide is discharged from the belt by means of a travelling tripper and delivered through canvas chutes to the boxes. Access platforms extend on both sides of the conveyor the full length, with spacious floors at each end. Grease gun lubrication has been adopted throughout. The handling plant will deal with up to 30 tons per hour.

Exhausters and Boosters.—The exhauster house at the end of the purifier and washer building contains duplicate sets of Connersville exhausters, coupled direct to high speed vertical steam engines, and fitted with 14 in. inlet, outlet, and by-pass connections. The exhausters and steam engines are mounted on a common bedplate, and are provided with all necessary steam valves and governors. In the same house similar sets of gas boosters are fitted in duplicate.

Tar and Liquor Separating Tanks.—The tar and liquor separating tanks of which two have been fitted, one located in the retort house for separating the tar and liquor from the hydraulic main, and a smaller one underground, outside the purifier house, which takes its supply from the various gas washing plants and mild steel mains. The tar and liquor drains are arranged from all portions of the plant and are coupled to an underground system of pipes. The tar and liquor from these separators run into concrete tanks approximately 7 ft. deep, under the purifier house revivifying floor. The tanks have a capacity of approximately 160,000 gallons of tar and 64,000 gallons of liquor.

Gas Governors and Station Meter.—The station meter is a Connersville patent positive displacement meter, having a maximum capacity of 3·6 million cu.ft. of gas per day, provided with 20 in. inlet, outlet, and by-pass connections, and fitted with a pressure, volume, time, and temperature self-recording apparatus.

The new 24 in. station governor is a duplicate of the existing one, and these are placed side by side in the meter house. The governors are fitted with inlet, outlet, and by-pass Western valves.

24 in. Gas Mains.—The whole of the gas mains between the retort house and the meter house are of mild steel welded construction, carried overhead and supported on trestles and brackets. Expansion joints have been arranged in the foul main between the retort house and the condensers to allow for expansion and contraction due to the varying temperatures. The various overhead mains are arranged to be adequately drained by means of three 6 in. down pipes in the foul main discharging into the tar and liquor separators, and by liquor drains from drain pockets at various other points in the pipe line.

Steam Supply.—Steam is supplied to the various points on the plant by a 6 in. main from the waste-heat boilers in the retort house, and by a 3 in. main from two existing Lancashire boilers. As a safeguard, the steam mains to the exhausters and boosters are run in duplicate with a double system of steam valves. A battery of dead-beat pressure gauges is grouped on the wall of the exhauster house, from which the direct pressures thrown by any part of the washing or purifying plant can be read.

Foundations and Buildings.—The building for the purification plant was erected, adjoining the existing water gas plant, and is situated on the west side of the railway lines, which run along the side of the new carbonizing plant. To obtain a ground surface suitable for a weight-carrying foundation it was necessary to excavate to a depth of 8 ft. where a solid bed of clay was found. Upon this a concrete raft was laid, with concrete walls and floor which form three watertight underground tanks, with a capacity of 224,000 gallons for storage of tar and liquor. Upon this underground tank foundation a brick building 158 ft. by 48 ft. was erected. The ground floor being for revivifying oxide, and above carried on concrete bases and steelwork are the purifier boxes.

The washer house is a ground floor building, 60 ft. by 48 ft., with series of concrete foundations carried down to the solid clay.

The exhauster house was built at the north end and measures 35 ft. by 31 ft. inside. It has a concrete basement which houses the gas mains to exhausters and boosters. The exhauster building is a lofty, well-ventilated room, being 26 ft. high having two sides composed almost entirely of steel and plate-glass windows, giving a feeling of "air and space."

The inner walls are glazed bricks, grey and cream in colour. The floor being black and white tiles. On top of this building is the cast-iron water tank with a capacity of 35,000 gallons. A feature of this structure is that the water tank is separated from the exhauster room by a ventilated chamber.

Laboratory.—The old exhauster house was converted into a new laboratory, 32 ft. by 28 ft., with glazed brick walls. The laboratory contains balance room; Boys' calorimeter; a main room with furnace and gas analysis bench; a distillation bench; fume cupboard with tiled base; apparatus cupboards, the whole making an effective and up-to-date laboratory.

Garden.—With the idea of showing that a modern gasworks and its surroundings need not be unlovely, and to make more cheerful conditions for the employees, the vacant land round the gasholders was utilized for flower gardens. Numerous shrubs, all of the flowering variety, were planted, sunken rose gardens, the walls of which were formed from the old horizontal retorts, and rockeries made from old concrete foundations and rubble and planted with many different varieties of plants, give a charming effect with the grass borders. The work was carried out by old employees of the establishment, who were being retained until eligible for a pension.

The reconstruction of the Bracebridge Works meant the closing of the original Newland Works, in so far as gas-

making was concerned, and this was done in November, 1932.

The adaptation of the Newland Works into a new gas distribution centre was then proceeded with, and the three gasholders dismantled, boosters being installed at the Bracebridge Works, and a high-pressure main to take their place.

The members will have learnt from their visit to the distribution centre how the original retort house has been converted into motor garages, the coal store into main stores, blacksmiths' shops into gas appliance store, boiler house now stores offices, exhauster house into offices, meter house into cooker cleaning department, purifier house into cooker renovating department, and revivifying house into fitters' and tinsmiths' shops.

Incidentally, I might mention the reconstruction of the Works resulted in a saving in working expenses of over £16,000 per annum. With a larger output, and in spite of the fact that we have, since the reconstruction, been paying charges on the old and new loan, the price of gas has been reduced 3d. per thousand, equivalent to £7,000.

Hire-Purchase Over Eight Years.

Having accomplished the reconstruction of the gas-Works, and the adaptation of the distribution department, the policy was to concentrate on the sale of gas appliances.

It was decided to endeavour to overcome the bogey of the old black type of gas cooker. Instead of the 1s. per week over a 4-years' period hire-purchase terms for a high grade "Regulo" cooker, it was decided to reduce the terms to 6d. per week over 8 years' period. The results exceeded even my most optimistic expectations, 3,070 cookers being sold in the next twelve months, and the sales of appliances and fittings for the year was £35,527, an increase over the previous year of £25,082.

A cleaning and spraying plant was also installed for renovating the old cookers, the out-of-date types being scrapped, and in the near future we shall be in the position of not having a black cooker on the district. At the same time we had introduced a maintenance scheme, whereby four of our employees were appointed to call at regular intervals on our customers to adjust burners, and see that the various gas appliances were giving satisfaction. This enabled them to gain access to consumers' premises, and their next objective was to endeavour to sell appliances. You will probably be surprised to know that the sales of these four men exceeded £300 per week at the commencement. Incidentally every employee in the department (except staff) is paid a small commission on any appliance sold.

Many of the old mains and services have been renewed and instead of meters being out for periods up to thirty years, we have concentrated on bringing all meters up to a ten year period and eventually hope to reduce this to five.

The next venture was to extend our supply systems to the neighbouring villages, and it may be of interest that although in some cases the Grid had preceded us, the gas supply was welcomed, and little difficulty was experienced in finding customers. As a matter of fact we have been asked to extend our area of supply to further villages.

The Industrial Load.

The next problem was the industrial load. In this ancient City of Lincoln we have several large engineering firms, the majority of whom were using producer gas and that imported product oil. For two years we tried to convince those concerned that gas had something better to offer, but without avail. Personal contact brought us nearer the solution, and it was eventually possible to persuade some of the firms to install trial furnaces. The results were satisfactory to a certain extent.

The difficulty was that although we had a low graded scale, the problem was to bridge the intervening period from the higher scale to the lower, at which figure gas could be considered on a competitive basis.

After due consideration, it was decided that gas for industrial furnaces, apart from quantity, should be at the lowest rate. This was agreed to in 1935, since when our industrial load has increased enormously (the total increase for the past twelve months being 63 million cu.ft., over 11%). Such a policy may appear unprofitable, but it must be remembered that as a municipal concern the Gas Department should make as great a contribution as possible towards the prosperity of local industry. Indirectly such a policy is bound to benefit the community generally by reason of the attraction it offers to new industries to settle in the district, with a consequent decrease in unemployment and the possibility of an increase in domestic consumption. In order to obtain a true perspective of the position, in December last, we issued a questionnaire to the various firms, asking them to try to forecast their approximate requirements over the next six months, twelve months, two years, and five years. The replies indicated that in the next two years the industrial load will be equivalent to half our present output—*i.e.*, 300 million cu.ft.

This only applies to firms who have been converted and frankly just at present we are somewhat nervous of exerting our energies to those who have not yet become conscious of the advantages and savings which gas has to offer.

Fortunately we are in the happy position of having paid off our loan charges on the old works, and we can face additions to plant without undue alarm.

The usual substantial allowances have been made for depreciation in the value of cookers and meters, the written down value of the works, plant, and other assets of the Undertaking now standing at £435,324. The total liabilities amount to £198,534 (of which £156,674 is outstanding loans) and there is therefore a balance of assets amounting to £236,789, or £38,255 more than the total liabilities. Other figures of interest are: Length of mains, 126 miles; number of consumers, 18,920; number of public lamps, 1,912; gas cookers installed, 14,029; credit balance increased from £3,275 to £22,452.

Housing Developments.

In 1930 the Corporation policy for their direct labour houses was to build the majority all electric and others all gas. We were able to convince them the fairest policy was to allow the tenants the choice, and the policy was then changed, and gas installed for heating and cooking, and electricity for lighting; the tenants, however, to have the right to change.

In the St. Giles area alone over 1,000 corporation houses have been built, which has necessitated a new high-pressure main being installed, and a Reynolds governor fixed. Incidentally the same main was extended for part of the new industrial load.

In the next few months, it is our intention to lay a new 12 in. high-pressure main from the Works for slightly over three miles to join up with the existing one, and we shall then have a circle of high-pressure main on the outskirts of the City.

At the time of the reconstruction, in view of the coke situation, it was not thought advisable to install a benzole plant, but in 1935 the demand for coke increased considerably, and a benzole recovery plant was put into operation in June, and has given very gratifying results.

I am particularly anxious not to detract from the efforts of my predecessors. They accomplished many things, and incidentally paid nearly £80,000 to the relief of rates. All credit is due to them for this achievement, although I personally do not agree with the principle of relieving rates from profit of a trading department. As I have indicated, the old policy was to pay off the outstanding loan on the original Works, which would have been quite all right if the Works had been kept up-to-date. Many members of the Council, however, were electrically minded and honestly convinced that gas was a thing of the past, so much so that when the reconstruction was suggested, it was openly stated it would be a waste of money. Thank goodness the public generally are now developing a different outlook, and have been made to appreciate that gas has still many advantages to offer, and there are still large fields to conquer and retain.

To emphasize my point, to-day we are all alive to the fact that the Gas Industry offers a future career equal to any other Industry and in many cases holds out even greater possibilities for the future. Only six years ago the Lincoln Undertaking had not a single youth or apprentice on the establishment. I contend that this kind of outlook is not only unjust to the rising generation, but to the well being of the Industry and the nation generally. To-day we have apprentices who also attend the evening classes, and the whole of the employees feel they are interested in the progress of gas.

The Gas Industry has realized that no matter how good your product is, the public must be educated up to its uses. The period has passed when you could wait for those people who wanted gas to come to you.

If the Government had taken only a reasonable interest in the Industry, which is still one of the most vital to the country's interests, in peace or war, they might have visualized that here was a field not only for relieving unemployment, by bringing obsolete works up-to-date, but also as in the case of Lincoln Undertaking, spending money on revenue-producing schemes.

At this stage I should like to say how much the Industry in general is indebted to the gas appliance manufacturers, who have also realized they cannot rest on past traditions. Their appliances to-day are not only pleasing to the eye, but what is more important, much more efficient than in the past. The result is that their factories are having, in many cases, to be extended to meet the increasing demand.

Gas plant manufacturers, who are at all times anxious

to place their services at the disposal of the Industry, have for many years been submitting cut throat prices to obtain business in order to keep their works going. I am not speaking without knowledge of the true facts. This seems altogether wrong, when so many undertakings are literally crying out for new plant.

I do feel, however, that the ancillary plant of the gas-works is in a general sense lagging behind. Surely modern ideas can evolve something better than the old type of purifiers, &c.

If I might offer a word of advice, to those about to make alterations to their Works, don't for the sake of a few hundred pounds capital outlay spoil what would otherwise be a good scheme.

We set out with the idea in mind that there was no reason why a modern gas-works should not be the equivalent of a water or electricity works, and I am pleased to say even the local press have acknowledged that the gas-works in Lincoln cannot now be alluded to in a degrading sense.

You will have gathered from the foregoing we commenced with a programme which has been carried through so far with success. Storage, works reconstruction, distribution, sales of appliances, and the industrial load, and, what is of equal importance, have completely altered the conditions for our employees.

Possibly some of you may recollect we were early in the field to install a gas compressing plant, but owing to difficulties beyond our control the scheme was eventually abandoned for the time being.

Competition.

During the past few years we have had to contend with energetic competition from another branch of the Corporation, the electricity department. There has existed the keenest rivalry, but so far as we are concerned, we have taken the view that both commodities are there to serve the community, and it is our duty to endeavour to educate the public to the many advantages which gas has to offer.

This we do in various ways, and particularly by constant advertising in all its forms, including talks to various organizations.

The Department has also had quite a fair measure of success in central heating installations for schools, &c., for which we have a special rate.

You will naturally have gathered that the successful progress made by the Department has only been accomplished by team work. I welcome this opportunity of expressing my appreciation to the whole of the members of the staff and employees. While I have to admit some of the alterations have been looked upon, shall I say, with a certain amount of suspicion or uneasiness because of their revolutionary character, I have nevertheless had willing support to carry things through.

If one thing has impressed me more than another, it is the willingness of the whole of those connected with the Industry to help one another. There is not the slightest hesitation, if someone has introduced something new in a gas-works, to throw same open for inspection to anyone interested, and furnish any desired information. This co-operation is all to the good of the Industry, and is definitely one to be encouraged, free exchange of ideas being for the good of all.

In conclusion, I do most sincerely desire to express my deep appreciation to all with whom I have had the pleasure of coming into contact during the past few years. The treatment I have received has been most generous and helpful. From the very first I was wholeheartedly welcomed by my fellow-members of the Eastern Counties, many of whom had known me on the gas plant side, with which I have been associated from boyhood. I must admit there was a certain amount of lifting of the eyebrows in some quarters when I crossed the floor of the Industry, and, frankly, I did so in a somewhat adventurous spirit.

If I have not regretted the change-over, one of the chief reasons is, as I have already indicated, because of the courteous treatment bestowed upon me, and the seal has been placed on all your generosity towards myself by the election to the office of President.

It is an honour which I appreciate more than words can convey, and if I can reciprocate by placing my services in any way to the benefit of the Industry in general, it will afford me pleasure, no matter in what minor capacity.

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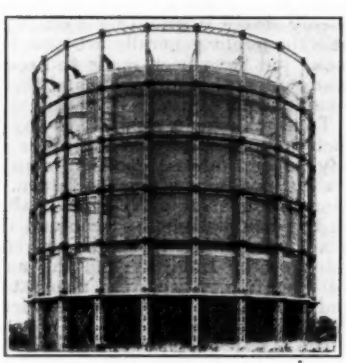

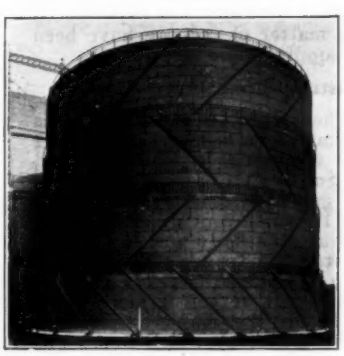

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Gas Light and Coke Company (No. 2) Bill

House of Commons Committee

(*Before Sir* RICHARD MELLER (*Chairman*), *Captain* O. PEAKE, *Mr.* R. RANKIN, *and Mr.* F. B. SIMPSON.)

(*Continued from last week's* "JOURNAL.")

Consideration of the Gas Light and Coke Company's Bill, by which power is sought to compel housing authorities who also own electricity undertakings to give the Company reasonable facilities for the carcassing of houses for gas, was continued on Tuesday, May 5. (The first day's proceedings were given in the "JOURNAL" for May 6, pp. 346-7.)

Mr. W. E. TYLDESLEY JONES, K.C. (for the Company), discussing the petitions against the Bill, said the first was by the Metropolitan Boroughs of Battersea, Bethnal Green, Fulham, Hammersmith, Hampstead, Islington, St. Marylebone, St. Pancras, Shoreditch, Southwark, Stepney, Stoke Newington, and Woolwich, and the Boroughs of Barking, Barnes, Ealing, East Ham, Ilford, Leyton, Southend-on-Sea, Walthamstow, and Willesden. He refuted the allegation made in the petition that the Bill would place the local authorities in an impossible position and would give the Company a free hand to install pipes and fittings however inappropriate they might be, or which might affect seriously the form of construction of the houses and the most economical design, and increase the cost of construction and maintenance. The majority of the authorities already conceded what was sought by the Bill. Again, the Bill would not enable the Company to install whatever they chose. The Company asked only for reasonable facilities for piping; if they were unreasonable, the matter could be brought before the Justices, who would order what they considered to be reasonable. (A sub-clause had been added to the Bill to make it quite clear that the word "fittings" related only to joints, angles, clamps, connections, and other like things used in placing the pipes.)

Another point made in the petition was that the provisions of the Bill were not limited to houses, but applied also to any shop, office, warehouse, or other building of any description if any part of it were adapted to be sold, leased, let, or otherwise disposed of. Therefore, if any part of a building belonging to the local authorities were at any time altered, the Company would have a statutory right to place their pipes and fittings throughout the whole of such buildings.

Counsel pointed out that local authorities might be reconditioning properties, and in so doing they could take out existing gas mains and refuse to allow the Company to put in new ones, or could refuse to allow the Company to install new pipes where there were none to-day. It was essential that the powers sought in the Bill should not be limited to new houses but should be extended to houses which were being altered. The statement by the petitioners that in the majority of cases no serious difference had arisen was an admission that differences had arisen in some cases and that unreasonable action had been taken in the past.

The West Ham petition stated that the property rights of the Corporation would be prejudiced by the Bill, but that was exactly what they had said in 1933. As to how their rights were injured, he said that the electrical people were those who were putting difficulties in the way.

The petitions by the Corporations of Finchley, Brentford and Chiswick, Heston and Isleworth, and Hackney were in substantially the same form, but there were one or two very interesting differences. It was pointed out that the provisions of the Bill were confined to such of the local authorities within the Company's area as were for the time being authorized electricity undertakings, whereas the 1933 Act of the Company extended to all County Councils, Borough Councils, or Urban or Rural District Councils. The petitioners stated that they would be prepared to prove that, to the extent to which it was reasonably required, they had made adequate and proper provision for the installation in their houses of pipes for the supply of gas as well as mains and cables for the supply of electricity. Counsel commented that in that case the Bill would not hurt the petitioners.

Councils Decide for Their Tenants

It was interesting to note that, whereas the Brentford and Chiswick and the Hackney Corporations asserted that their control of the supply of electricity had in no degree influenced their decision as to the method of lighting and heating which could most economically be provided and which would best meet the needs and requirements of their tenants generally, the Finchley and the Heston and Isleworth Corporations did not make that assertion. Apart from such exceptions, the petitions were worded similarly, and were drawn up by the same Parliamentary Agents; the exceptions were a little remarkable. Further than that, the fact that two of the petitioners had asserted that their control of the supply of electricity had not influenced their decision connoted that they did come to some decision as to the method of lighting and heating which could most economically be provided and which best met the needs and requirements of the tenants generally. That, however, was the very thing which Parliament had said the tenants themselves should be entitled to decide.

Counsel welcomed a statement in the petitions that the provisions of the Bill might lead to unnecessary capital expenditure by the Company on the provision of gas pipes in houses or other buildings in which a supply of gas might not be required, and that the petitioners, as representing the interests of the gas consumers, objected strongly to the Bill in so far as it might have the effect of increasing the price of gas. That confirmed, he said, the statement he had made earlier, that any unnecessary expense in which the Company was involved prejudiced gas consumers. The Company had found in fact, however, that where houses were carcassed, the inhabitants of more than 90% of the houses used gas, and if the Company were allowed to carcass the houses during construction a great saving of cost would be effected. The Company was quite satisfied that it would be good business to carcass all the houses.

Mr. *R. W. Foot* (General Manager, Gas Light and Coke Company) gave evidence in support of the Bill, and said that of the 31 local authorities owning electricity undertakings within the Company's area, 28 had opposed the Bill. The three who had not opposed were Grays Thurrock, Hornsey, and Tilbury. Witness described the two-part tariff which was available to consumers in addition to the flat rate for gas, and said that many prepayment consumers benefited by the two-part tariff; such a consumer would begin to benefit by reduced price if he used 175 therms per annum under that tariff, and if his house were fully carcassed there was no reason why he should not take the opportunity of doing that. If the house were not fully carcassed, the consumer had not that opportunity.

Discussing the advantages of being able to carcass houses during construction, Mr. Foot said in the case of a house the extra cost of carcassing after the house was completed, as compared with the cost of carcassing during construction, was at least 50%; in a block of flats, where the floors were laid probably in concrete, the extra cost was 100%.

It had been represented by West Ham that their practice was to allow facilities for the supply of gas for heating and cooking and electricity for lighting. He had certainly thought that, as the result of the 1933 Act, the Company had the legal right to carcass the houses; but the Company had since been advised that there was a gap in that respect and that the only way in which to fill it was to secure another Act.

Referring to some of the houses which the Company had been allowed to carcass, and with regard to which it was stipulated that they were not to be carcassed for lighting, Mr. Foot suggested that that stipulation was a breach of the Act of 1933, and said he was quite certain that if the houses had been carcassed for gas lighting some of the tenants would have taken advantage of it.

Although the West Ham Corporation had given the Company the names of tenants going into houses which were carcassed for gas, they had refused to give the names of tenants going into houses which were not carcassed for gas.

Cooking and Lighting.

Mr. TRUSTRAM EVE, K.C. (cross-examining on behalf of all the petitioning local authorities other than West Ham), secured agreement from witness that, since 1933, the only trouble experienced with any of those local authorities in regard to carcassing was a temporary trouble with the Willesden Council. With regard to a statement, made on the previous day, that 92% of the householders in the Company's area of supply cooked by gas, 7% by electricity, and 1% by coal, Counsel asked that he should be provided with information showing what were the percentages of householders using gas and electricity for lighting, and how many of the houses the Company had carcassed for gas during the years 1932-35 had been carcassed to include gas lighting.

Asked whether he considered it satisfactory that 92% of the householders were cooking by gas, Mr. *Foot* said the figure was not a bad one, but he saw no reason why the remaining 8% should not be converted in course of time.

Mr. E. MACASSEY (cross-examining on behalf of the West Ham Corporation) urged that prospective tenants of the Corporation's houses were given the option, at the outset, of a gas or an electric house.

Mr. *Foot* replied that it was not his information.

Mr. MACASSEY added that the Corporation did not put obstacles in the way of tenants who wished to change.

Mr. *Foot* remarked that there remained a good deal more to be said about the matter, but he was not sure that he was the person to say it.

Mr. MACASSEY stated that, of 56,000 houses in West Ham, 1,913 belonged to the Corporation; some 40,000 were artisan dwellings. An assisted wiring scheme had been in operation since 1932, and since that time 33,623 persons had adopted it, of their own volition, in order to secure supplies of electricity; they were not tenants of the Corporation.

Mr. *Foot* replied that, if that were so, it indicated the advantage of freedom of choice.

When asked if it were a fact that for lighting purposes electricity was gradually taking the business away from gas, Mr. *Foot* said he did not admit that altogether, because there was still a very large consumption of gas for lighting, particularly among the working classes.

Mr. MACASSEY, referring to a statement that 51 out of 63 Councillors at West Ham used gas in their homes, said that no fewer than 25 of them used electricity for all purposes, including cooking.

Mr. *Foot* said his records showed that 51 of them used gas for some purpose or another, and he did not think Mr. Macassey's information could be correct.

Re-examined as to why it was necessary that the provisions of the Bill should apply to local authorities who had not in fact prevented the Company carcassing houses. Mr. *Foot* said that the Company was at the mercy of a change of policy on the part of an authority following a change of majority.

While it was true that in a large number of cases the working classes were using electricity for lighting, he believed that if their premises were carcassed to enable them to use gas for lighting a very large number of them would in course of time come back to gas. That was the experience already.

Captain PEAKE (a member of the Committee) said he did not appreciate why the provisions of the Bill applied only to housing authorities that were for the time being authorized electrical undertakers; it was possible that in course of time housing authorities which were not at present electrical undertakers might purchase electrical undertakings.

Mr. F. J. WROTTESLEY, K.C. (for the Company), replied that that eventuality was covered by the wording in the Bill. The Company did not seek powers to cover other local authorities, because if there were no inducement there was no difficulty. It was not desired to make the terms of the Bill wider than was necessary to effect the Company's object.

Mr. TRUSTRAM EVE, K.C., said the reasons why three of the local authorities who owned electricity undertakings within the Company's area did not petition were that Tilbury had quite recently ceased to be electricity undertakers, Grays Thurrock had become electricity undertakers only since the Bill was deposited, and Hornsey were electricity undertakers only in respect of a very small part of the Gas Company's area.

Mr. *W. G. Spittle* (Gas and Heating Engineer), a contractor to the Gas Light and Coke Company for the installation of pipes, gave figures showing the costs of carcassing. The cost of carcassing a 3-bedroom house and providing points for a cooker, a copper, three fires, and a portable heater, during the erection of the house, was £2 15s. per house. If the work had been done after the houses were completed, the additional cost would have been £1 7s. 6d. per house, so that the total cost would have been £4 2s. 6d. per house instead of £2 15s. Discussing the provision of points for a cooker, a copper, two fires and a portable heater, which would cost £2 10s. in the case of flats during erection, he said that owing to the fact that the floors of flats were sometimes made of concrete or hollow blocks, the pipes would have to be placed round the walls, after which the walls would have to be made good and re-decorated. The estimated cost under those circumstances would be £5 (instead of £2 10s.) exclusive of the cost of re-decorating. Further, the costs would be greater on the higher floors than on the ground floor.

Mr. *Harold Joseph* (a builder and estate agent, of Barking Road, East Ham) said that he built houses varying in value from £500 to £1,500. He had never been asked to build an all-electric house. As an estate agent he had had two on his books for sale, and he had had to arrange an allowance to the purchasers of the houses for gas carcassing. There seemed great hesitation on the part of housewives in taking over an electric cooker after having been accustomed to a gas cooker. The cost of carcassing would be probably three times as great after a completion of a house (including cost of re-decorating) as compared with carcassing during the erection of the house.

Mr. *G. S. Gadsby* (Local Manager at the Gas Light and Coke Company's Barking Road Office) corroborated the statements made concerning the Company's experience at West Ham.

Wednesday, May 6

Of the five consumer witnesses who gave evidence, the first was Mrs. *Ada Schaltz*, who has occupied an all-electric house since April, 1935; while she did not complain of the electric cooker as such, she had found its use expensive, so that she did not use it very much, but cooked on a stove heated by coal. Before leaving her previous address a representative of the electricity department had called upon her. She was told she could have an all-electric house, but if she wanted a house fitted for the use of gas she would have to wait.

The CHAIRMAN said the real point it was desired to get from the witnesses was whether they desired gas or electricity and whether they could obtain what they desired.

Sir LYNDEN MACASSEY said he would make the point that in the exercise of their responsibilities as a housing authority the Corporation claimed the right to insist that houses were lit by electricity as a proper policy.

Mr. H. ROYSTON ASKEW (for the Company) asked if that decision was irrespective of the tenants' needs.

Sir LYNDEN MACASSEY: Certainly.

In reply to further questions, witness said that she preferred electricity for lighting, but preferred gas for cooking because it was a lot cheaper.

(Other housewives gave evidence of a similar character with regard to their preference for gas cooking.)

Some discussion arose which culminated in the Committee deciding not to hear evidence concerning the extra cost of providing flues in houses, inasmuch as the matter was not pleaded in the petitions.

Sir *David Milne-Watson* (Governor of the Gas Light and Coke Company) gave evidence and confirmed statements made previously by Counsel concerning the standing and activities of the Company. He said that the great majority of the local authorities within the Company's area had accepted the Company's Act of 1933 in the spirit in which it was meant, and had afforded tenants freedom of choice. Only West Ham had tried to drive a carriage and four through the provisions of that Act. It was being done by assuming that they were the people to decide how many of their tenants should cook by electricity and how many should cook by gas, for they had said deliberately that 50% of the cooking should be done by gas and 50% by electricity. But why suggest percentages, and why should West Ham be the judges? The Company objected to mixing up the landlord and the supplier of light and heat. He had no quarrel with electricity suppliers trying to get business, provided they were not linked up as a housing authority. Prospective tenants found it difficult to get houses unless they signed a two-year contract to use electricity, and that state of affairs prejudiced their choice. The Company asked Parliament to implement its decision of 1933 and to ensure that the tenants were given freedom of choice.

Mr. NEEP (cross-examining on behalf of the petitioning local authorities other than West Ham) said that the Bill applied to any house, shop, office, warehouse, or other building of any description.

Sir *David Milne-Watson* replied that if people wished to use gas in shops or anywhere else they were just as much entitled to use it as they were entitled to use water or electricity.

Mr. NEEP complained that the provisions of the Bill were so widely drawn that if, for instance, an alteration were made to a Town Hall, the Gas Company would have a right to carcass the Town Hall for a supply of gas.

Mr. F. J. WROTTESLEY, K.C. (for the Gas Company), said that the Company asked merely for reasonable facilities, and if objections were raised they could be submitted to the Justices for decision. He thought that words could be included in the Bill to safeguard Town Halls.

Mr. NEEP said there were other buildings which would come within the same category as a Town Hall. There was a genuine fear with regard to such buildings, and he would indicate to the Committee later the types of buildings that it was desired should be safeguarded.

Thursday, May 7

Mr. E. J. C. NEEP (resuming his cross-examination of Sir David Milne-Watson, on behalf of the opponents to the Bill other than West Ham) pointed out that in the Bill buildings were defined as "any house, shop, office, warehouse, or any other building of any description," and also as any building or part of a building "adapted to be sold, leased, let, or otherwise disposed of." He asked if it were the intention that the Company should have power to carcass public baths, for instance, which were let for a few evenings a week during winter.

Sir *David Milne-Watson* said that it was. He also agreed that the Bill would include public halls, public libraries, schools, pavilions in parks or recreation grounds, shops and refreshment rooms, and even electricity showrooms. He added, amid laughter, that he thought it would be a good thing for the latter.

Mr. NEEP pointed out that the only concrete example referred to in evidence related to houses.

Sir *David Milne-Watson* replied that that was because the problem had arisen with regard to houses. When asked if evidence with regard to other buildings was to be called, he said not unless the Committee required it. It seemed not to be realized, he said, that gas was a public utility, and, therefore, had a place in buildings such as baths and schools, just as in houses. Naturally, the Company would not press for permission to carcass an electricity showroom, and was willing to leave out that sort of thing; they must be reasonable. Under the terms of the Bill, local authorities could make any reasonable objection to a proposed carcassing.

Mr. NEEP asked whether it was the intention that, if a local authority considered that to give facilities for piping would impose additional expense upon them in connection with their buildings, the matter should be enquired into by the Magistrates.

Sir *David Milne-Watson* said it was not, because that matter had already been decided by Parliament. It was debated at very great length in connection with the proceedings on the Company's 1933 Bill; at that time it was ruled once and for all that there should be freedom of choice, and the question as to whether or not it would be more expensive to give freedom of choice did not arise now.

Mr NEEP said that a local authority might consider that in a particular house having two bedrooms only one of the bedrooms should be carcassed for a gas fire, which meant that it would not be necessary to provide a special flue in the other bedroom. There might be difference of opinion as to whether one or both bedrooms should be carcassed for a gas fire, and he asked whether the Company would be prepared to submit that question to the Magistrates.

Sir *David Milne-Watson:* Certainly not.

The CHAIRMAN said he was puzzled, because Counsel was suggesting a limitation of the number of rooms in which gas fires

should be used. It was suggested that if a tenant, having moved into an all-electric house, desired to use gas, he would be limited because the local authority would say that it could not permit the use of gas because the room was not suitable for it.

Mr. NEEP replied that there might be difference of opinion, for example, as to whether a pipe should run in one direction or another—he was not stressing the question of flues for the moment—and he could conceive of cases in which a particular form of carcassing might impose extra expense upon the local authority concerned.

Mr. WROTTESLEY, K.C. (for the Company), said that the question of distinguishing between houses and other buildings was considered in connection with the 1933 Bill, and the only exception made was in regard to kiosks on piers and on sea fronts, which were special cases. In 1933 the Committee which had considered the Bill had been asked to distinguish between shops and houses, but had refused to do so; and Section 27 of the Gas Undertakings Act of 1934 stated that it should not be lawful to make distinction in respect of *any* premises owned by the local authorities.

Mr. NEEP pointed out that certain Councils, and in particular Hampstead and Brentford and Chiswick, had erected housing estates outside their boroughs and outside the areas in which they supplied electricity. He asked if it were the intention that such estates should come within the terms of the Bill, for he had thought the Bill was to cover buildings owned by local authorities and which were within the electricity supply limits of those authorities.

Sir *David Milne-Watson* considered that such buildings should come within the terms of the Bill.

Sir LYNDEN MACASSEY, K.C. (for the West Ham Corporation), urged that local authorities who did not own electricity undertakings would be free to adopt the policy with regard to electric lighting which they considered to be to the advantage of their tenants, for the present Bill related only to authorities owning electricity undertakings.

Sir *David Milne-Watson* replied that that was on account of the mixture of landlordism and ownership of electricity supply, where they could force people to use their shop, so to speak; Parliament had always set its hand against that.

Sir LYNDEN MACASSEY said it seemed that freedom of choice depended on which undertaking had the best canvasser.

Captain PEAKE (a member of the Committee) suggested that it did not depend entirely on which undertaking had the best canvasser; surely it was just as important to have a good case as to have a good Counsel to put it forward!

Sir *David Milne-Watson*, replying to a reference by Sir Lynden to the Company's rateable value in West Ham being reduced owing to the sales of gas having fallen, said that the Council had been engaged in killing the goose that laid the golden eggs.

Mr. WROTTESLEY, K.C. (for the Company), referred to the Council desiring to dragoon 50% of the tenants of their houses into cooking by electricity.

(This concluded the case for the Bill.)

Captain PEAKE pointed out that the wording of the Bill required the housing authorities to give the Company reasonable facilities in respect of any buildings which for the time being were in process of "erection, re-erection, conversion, or alteration." He asked whether, if part of a building were in process of conversion or alteration, the Company would have power to carcass the whole building.

Mr. WROTTESLEY thought that it would, but the Justices could deal with the matter if the Company made an unreasonable claim. However, the Company did not wish to rip up the walls throughout a building merely because a trivial conversion was being made, and would be content that the powers should be limited to the carcassing of only that part of the building that was being converted or altered.

Mr. E. J. *Johnson*, O.B.E. (Borough Treasurer, West Ham), gave evidence on behalf of the West Ham Corporation. Acting under the instructions of the Housing Committee, he had control and management of the Corporation's houses. He gave particulars of the numbers of houses that had been made available from time to time, some of them all-electric houses, and others in which provision was made for lighting by electricity and cooking and heating by gas. In the event of a slum-clearance scheme, the tenants of the houses to be demolished were notified and were asked to interview a representative of his Department; at the interview they were informed of the number of houses available of each type, and were given absolute freedom of choice. Notifications as to the people who were to be re-housed were made to the Gas Company and to the Electricity Department, there being no preference. Further, the minutes of the Corporation proceedings were available to the Gas Company as well as to the Electricity Department.

At one period, owing to a mishap, the builders of some of the Corporation's houses were unable to carry out their contract, and at that period there might have been a possibility of an insinuation that only all-electric houses were available for the time being. Electricity was available, on the domestic tariff, at an all-in rate of 1d. per unit, and the number of electric cookers installed at West Ham had increased from 626 in 1930 to 8,365 in 1936.

Mr. WROTTESLEY, cross-examining, said it had not been suggested to Mrs. Schaltz, who had given evidence on behalf of the Company, and who had moved into an all-electric house, that there was any delay in the construction of the gas houses.

Mr. *Johnson* replied that there was a period of only six weeks between the availability of an all-electric house and a gas house.

Mr. WROTTESLEY asked why the Corporation had exacted from Mrs. Schaltz an agreement to use electricity for two years, when it was known that she had wanted a gas house.

Mr. *Johnson* said it was the practice to sign an agreement. He did not agree that Mrs. Schaltz had been forced to take electricity and contended that she had had freedom of choice. The houses in which such tenants had been living previously were such that they were all anxious to move into new houses.

Mr. WROTTESLEY, having ascertained that far more of the tenants of the Corporation's houses cooked by gas than by electricity, and, having obtained an answer from witness that electric cooking was in its infancy, asked why the ladies of West Ham were compelled to use a system which was in its infancy.

Mr. *Johnson* replied that they were exhibiting a tendency towards electric cooking.

Later, witness admitted that electricity was not used for cooking in his own home.

Mr. WROTTESLEY said that if the Council erected houses in accordance with the wishes of the people who were to occupy them, the proper thing to do was to ask them, before they moved, whether they wanted electricity or gas houses, and to provide the houses in the proportions indicated.

Mr. *Johnson* said that the Council in fact did that.

Asked how he would square that statement with the Council's policy of providing electric and gas houses in the proportions of 50/50, witness said that the people wanted the electric houses; otherwise the Council would have varied the proportions.

The CHAIRMAN (Sir Richard Meller) asked whether, if all the gas houses were occupied and only all-electric houses remained, there was any freedom of choice.

Mr. *Johnson* replied that he knew of no instance in which that had occurred, apart from the occasion of the breakdown of the builder's contract.

The CHAIRMAN pointed to witness's figures showing the increase in the number of electric cookers used, and asked how witness accounted for the big change-over from gas to electricity if there had not been more intensive canvassing by the Electricity Department after the passing of the Gas Company's Act of 1933.

Mr. *Johnson* said it was because of the price, electricity being much cheaper.

Captain PEAKE pointed out that whereas one tenant in three in the Corporation's houses, taken as a whole, cooked by electricity, when one considered only the houses built during the last two years the proportions were about six using electricity and three using gas. He asked if that indicated that some influence was at work during the last two years which had tended to increase the use of electricity.

Mr. *Johnson* replied that the scale of charges for electricity, introduced recently, had rendered the use of electricity for cooking more advantageous than gas.

Captain PEAKE pointed out that the same charges were open to the tenants of all the other houses, where the proportion of electricity users was much smaller.

Mr. *Johnson* suggested that they might be older people, who were reluctant to change.

Mr. ABADY (for the Company) said that the Company had refrained from putting forward evidence as to costs, because it was irrelevant to the problem of freedom of choice. But he was prepared to re-open the matter if the Committee so desired.

The CHAIRMAN replied that the Committee had heard only the witness's opinion.

Mr. *L. H. Keay*, F.R.I.B.A. (Director of Housing, Corporation of Liverpool), said he had been responsible for the erection of 23,000 houses and flats in Liverpool, and was responsible for the management of an estate of 31,000 odd houses and flats. In his view, electric lighting was the only practice that West Ham could adopt. A room lit by electricity need be only 8 ft. high from floor to ceiling, whereas if gas were to be used the height of the room must be increased by 6 in.; that affected the design of the house. Therefore, one must know before a house was designed whether it was to be lit by gas or electricity.

Lighting and Room Height.

Replying to a question by Captain Peake as to whether a local authority would be able to veto gas lighting because the rooms were not sufficient height, Mr. *Keay* said he believed that as landlords they could. The old building by-laws had stipulated a height of 8 ft. 6 in. from floor to ceiling, assuming that the rooms would be lit by gas, but under the Building Acts the height was reduced to 8 ft. where it was known that electricity was to be used for lighting.

In the few cases in which gas had been used for illumination in municipal houses in Liverpool the Corporation had been petitioned to take out the gas and had in fact done so. All the Corporation houses there were lit by electricity, with the exception of about 60 houses erected after the war and 2,000 erected before the war. The 60 would be lit by electricity within the next year; the tenants of the 2,000 old houses had petitioned for substitution, and their wishes would probably be met.

It was not desirable that, as the result of energetic canvassing, there might be a change from gas to electricity, or *vice versa*, with every change of tenancy, for it involved considerable expense to the Corporation.

Replying to Mr. Abady, in cross-examination, witness said he objected to gas lighting in any circumstances. When asked whether he disagreed with Parliament's policy, as enacted in the Company's Act of 1933, that there should be no restriction, he said he considered it particularly unfortunate.

Mr. ABADY said Mr. Keay's evidence was directed to show that in his view there should be an amendment of that legislation.

Mr. *Keay* said he would like to see it.

Re-examined, he said he looked forward to the time when

electricity would be supplied to all houses as water is supplied, and when its use would become general for heating, cooking, and lighting.

Replying to the Chairman, he said that in the Liverpool houses a gas point was installed in each scullery for a gas cooker only; it was a very minor carcassing. He knew of no instance in which tenants had asked for an extension of the carcassing.

Captain PEAKE asked whether witness regarded the provision of a flue as being desirable in every living room or sleeping room, quite apart from the question of heating.

Mr. *Keay* replied that he did not; the provision of an air vent was sufficient.

Mr. *J. W. J. Townley* (Borough Electrical Engineer, West Ham) gave particulars of the increased use of electricity for cooking and of the equated tariff devised at West Ham with a view to increasing business. He also suggested that the houses referred to by the Gas Company, in which gas apparatus had been installed where previously electrical apparatus was installed, and where 73 gas lighting points were provided, were not using the gas for lighting to any material extent, because the consumption of electricity for lighting in all but two of those houses was above the average for the type of house during the year ended March, 1936.

Discussing the reason for securing two-year agreements from tenants, covering the use of electricity, he said that when the first electrically-equipped houses were erected in West Ham there was no hire agreement or any agreement to use the electrical apparatus. As the result of canvassing by the Gas Company, a certain number of tenants had changed over to gas, but in a number of cases it was found quite easy to persuade them to retain electricity. It was felt, however, that some deterrent to change was advisable. The agreements did not involve penalty.

Captain PEAKE said that if a tenant could be compelled by agreement to retain an electric cooker, it became extremely inconvenient to change over to gas, for it would mean having two cookers side by side.

Mr. *Townley* said his Department was doing the same as the Gas Company.

Captain PEAKE said he understood that the Gas Company did not insist upon a two-year agreement, except in the case of a special cooker.

Mr. *Townley* replied that that was not his information.

With regard to the West Ham Councillors, he said that 60 of the 62 had electrical installations, and he gave figures to show that they were substantial users of electricity.

Mr. ABADY, on rising to cross-examine, said he wished to get back as quickly as possible to the question the Committee had to decide. He pointed out that the equated tariff of 1d. per unit in West Ham applied where tenants used 20 units per week and undertook to do so for two years. A tenant would not use 20 units per week for lighting only, so that if he used gas for cooking and electricity for lighting, he would have to pay 3½d. per unit for lighting as a penalty.

Mr. *Townley* replied that it was not a penalty; 3½d. per unit was the market price for lighting.

Asked why he was averse to the provision of a gas pipe in a house, so that a tenant who wanted gas could use it, witness said that when both gas and electrical equipment were available, one or the other was redundant, and as an engineer he objected to redundancy and waste of capital.

Cookers Installed in 1935.

Mr. ABADY pointed out that the increased consumption of gas in the Company's area in a year, expressed as an equivalent number of units of electricity, was 87¼ million units. That was a figure approaching the total annual consumption in West Ham. (His basis of conversion was 1 therm per 29 units.) He also pointed out that in 1935 the number of gas cookers installed in the Company's area had increased by 48,000, which showed a progressive gas-mindedness.

Mr. *Townley* did not agree, because 8,000 electric cookers were installed in West Ham, so that 8,000 gas cookers had been taken out, during the last three years.

Mr. ABADY pointed out that the figure of 8,000 was not accurate in regard to gas cookers, because some of the 8,000 electric cookers had been installed in new houses, in which there were no cookers installed previously.

In re-examination, witness said that the Electricity Department at West Ham had contributed more than £20,000 to the rates over the last few years.

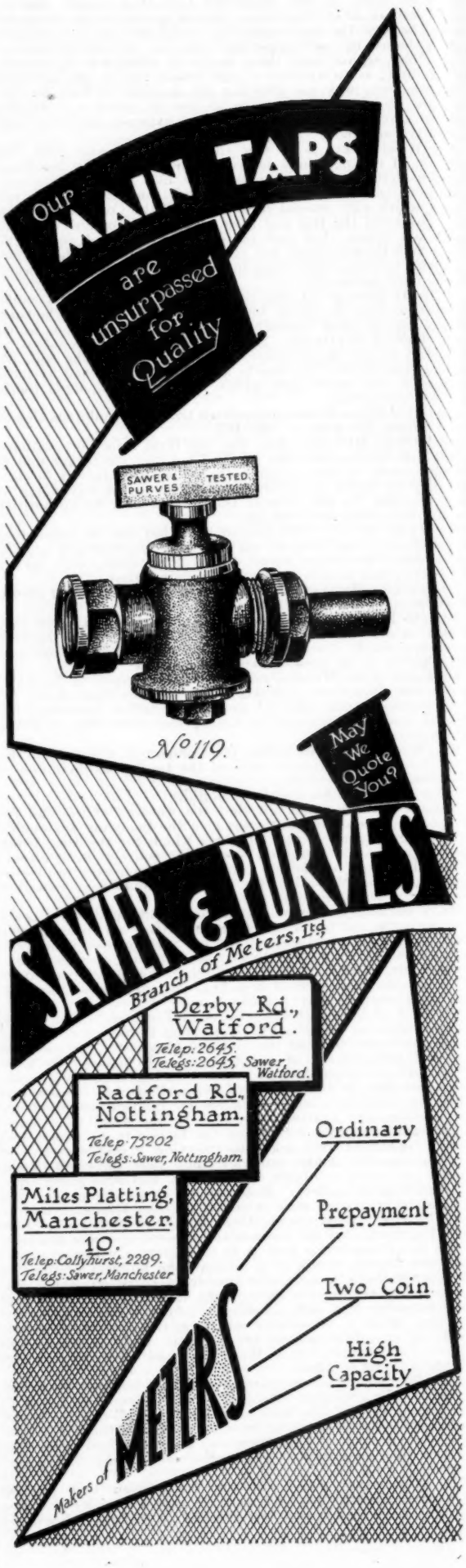
Mrs. *Sparkes* (a consumer occupying an all-electric house in West Ham) said she was satisfied with her electrical equipment, which afforded a cheap means of heating, cooking, and washing. The Corporation had not compelled her to take an all-electric house. When approached by the Gas Company she had allowed them to install a gas cooker and copper and lighting, but she had ceased to use them.

Following similar evidence from another satisfied electricity consumer, the Committee conferred in private and subsequently announced their conclusion that the preamble of the Bill had been proved, but they would be prepared to hear arguments with regard to the amendment of the wording relating to the types of buildings to be covered, for they felt that the wording was somewhat wide.

Mr. W. E. TYLDESLEY JONES (for the Company) said that the Committee had given a decision, believing that Counsel for the opponents had not wished to address them. He suggested that, in order to avoid any sense of grievance, Counsel might be invited to address the Committee. He was anxious to avoid a decision in his favour against opponents who might say they had not been fully heard.

The CHAIRMAN said that if there was a desire to address the Committee, the Committee was still prepared to hear them.

(The proceedings were adjourned until May 11.)



Cape Town and District Gas Light and Coke Company, Ltd.

The Forty-Sixth Ordinary General Meeting of the Cape Town and District Gas Light and Coke Company, Ltd., was held at the Company's Offices, 38, Grosvenor Gardens, S.W. 1, on Tuesday, May 5, 1936, at 12.30 p.m.—Sir GEORGE L. BARSTOW, K.C.B. (Chairman of Directors), presiding.

The MANAGING DIRECTOR AND SECRETARY (Mr. R. W. Blackburn) read the notice convening the meeting, together with the Auditors' report on the balance-sheet. The Directors' Report and Statement of Accounts for the year ended Dec. 31, 1935, were taken as read.

THE CHAIRMAN'S ADDRESS.

The CHAIRMAN, in moving the adoption of the Report and Accounts, said that he proposed to deal in the first place with the outstanding features of the accounts, which were presented in a form which, he thought, could easily be followed.

Referring first to the capital account, the only alteration was the item of £4,135 under the heading of additions. This represented the net cost of new high-pressure extensions to which he would refer later. The balance carried to the general balance-sheet was increased by this amount to £109,000.

Dealing with the general balance-sheet at the foot of the accounts, the Chairman pointed out that, on the assets side, a new fleet of motor vehicles had been put into operation, replacing vehicles which had become obsolete and costly to maintain, and providing increased facilities for service to gas consumers. The item of Hire Fittings at £18,750 was higher by £1,435, while stock in hand was more by £3,385, due to a heavier stock of gas appliances. Other items on this side of the account called for no special mention.

On the liabilities side the addition to general reserve and contingency account of £7,214 was a transfer from insurance reserve not required, as mentioned in the Report.

Revenue Account.

The total income from all sources had fallen from £85,125 in 1934 to £83,886—a decline of £1,239. Receipts from gas sales were down by £599 and those from residuals and other sources by £640.

On the other side, expenditure at Cape Town increased by £1,147 to £66,219, the increase being mainly due to higher cost of coal. A saving of £326 was effected in London expenditure, making the net increase in expenditure £821, which, together with the decline in receipts to which he had referred, made the balance available (at £14,774) less by some £2,060 compared with the figure of the previous year's accounts.

The net revenue account showed how this balance was dealt with, leaving the sum of £1,433 to be carried forward. Unfortunately, it was only too plain that funds were not available for dividends on preference or ordinary shares.

The results were, frankly, disappointing, and he was sorry not to be able to give a better account in his first year of Chairmanship. The competition they had to meet was not less acute than in previous years, and they were advised that, notwithstanding the growth of expenditure in various directions, it would not be politic to raise the charges to gas consumers. As regards expenditure, they had impressed on the Management the necessity for the most careful economy being exercised consistent with proper maintenance and efficient working of the Company's undertaking.

Although the reduction in gas revenue was unwelcome, it was not very large—being under 1%. Consumption of gas improved by 1%, and further progress had been made in bringing the amenities and convenience of gas to the notice of the public and in making known the additional services now available to existing and prospective gas consumers.

In the provision of new modern equipment now demanded by gas users much still remained to be done, but they hoped to secure additional revenue, particularly from the increasing demands for gas for industrial purposes. The most encouraging feature of the year, observed the Chairman, was that alluded to in the Directors' Report—namely, the construction of a high-pressure system to serve new developing districts some four miles from the Company's Woodstock main. He was happy to say that this work was completed by the end of the year, and they had already in 1936 sold a substantial quantity of gas through the new main. With the growth of Cape Town and increased prosperity there they might reasonably hope to secure additional business in spite of all competition.

The Chairman concluded by paying tribute to the Company's staffs in Cape Town and London. Working under very difficult conditions indeed, he felt sure they were doing their best to improve the position of the Company's business.

He then formally moved:

> "That the Directors' Report and Statement of Accounts for the year ended Dec. 31, 1935, now presented, be and they are hereby adopted by this Meeting."

The resolution was seconded by Mr. EDWIN NICHOLLS.

In reply to questions raised by shareholders, Mr. BLACKBURN stated that the total sales of gas amounted to 178,300,000 cu.ft., and they hoped that there would be a very considerable increase from the new extensions carried out. Increased sales of gas for the first quarter of the current year showed a very satisfactory rate of progress.

Replying to a question in regard to competition, the CHAIRMAN said that the Company's principal competitor was the Cape Town Municipal Electricity Undertaking, which sold current at an extremely low price; there was also, of course, a certain amount of competition from oil.

The resolution for the adoption of the Report and Accounts was then put to the meeting and carried unanimously.

Re-Election of Director and Auditors.

The CHAIRMAN thereafter moved the re-election to the Board of Mr. Edwin Nicholls, the Director retiring by rotation and offering himself for re-election. Mr. Nicholls had not been a Director for very long, remarked the Chairman, but he had been a shareholder for a considerable period, and he was an extremely valuable member of the Board.

The proposition was seconded by Mr. W. J. BRADFORD and carried unanimously, and, in acknowledgment, Mr. NICHOLLS said he was very much obliged to the meeting for re-electing him; he would continue to do his very best to serve the interests of the Company. For many years he had sat on the other side of the table and had asked questions of the Board; but now he was better able to appreciate from the inside the difficulties which confronted them. He assured the shareholders that everything that could be done was being done to bring the Company into smoother waters.

On the proposition of Mr. A. E. HAYES, seconded by Mr. E. J. DAVISON, the Company's Auditors (Messrs. Kemp, Chatteris, Nichols, Sendell, & Co.) were unanimously re-appointed at the same remuneration as previously.

Vote of Thanks.

Mr. HAYES proposed a vote of thanks to the Chairman and Directors which was unanimously accorded. He went on to say that shareholders sympathized with them in the hard task they had before them, and he was convinced they were doing their best to improve the position. He remarked that the expenditure on repairs and maintenance seemed to remain at a fairly high level and enquired the reason.

Mr. BLACKBURN, in reply, agreed that maintenance expenditure did appear high in relation to sales of gas; but it must be remembered that conditions of supply in Cape Town differed from those in, for example, the United Kingdom. The Company had now in operation some 150 miles of mains, and the number of consumers per mile of main was small and consumption of gas per mile of main relatively low. Maintenance costs in relation to output would naturally be considerably higher than was the case here in England. The matter was, however, receiving attention by their officials at Cape Town, and it was hoped that improvement would be effected, particularly as it had been considered inadvisable to attempt to raise gas prices in the face of the acute competition that had to be faced. He observed that electric current was being offered in their area at a price which, if supplied by a private undertaking, could not possibly cover interest on capital. Their Company, on the other hand, had to meet standing charges.

The Chairman of their Local Committee and the General Manager and Engineer of the Company had recently visited London for the purpose of conferring with the London Board, and it was hoped that as a result some retrenchments would be found possible which would benefit the position. An increase in sales of gas in the current year also would naturally tend to reduce overhead charges per 1,000 cu.ft. of gas sold, and the prospect in this regard certainly seemed a little more favourable.

Mr. HAYES went on to refer to the work of the staff in Cape Town who obviously had to carry on in very difficult conditions; it would be nice for them to feel, he suggested, that they had the shareholders' support.

The CHAIRMAN thanked the Meeting for the kind and sympathetic expressions which had been made in regard to the Board and the staff. They would continue to do all they could to bring prosperity back to the Company.

The meeting then terminated.

THE SUTHERLAND METER CO. LTD.

ELECTRIC AVENUE, WITTON
BIRMINGHAM, 6

TELEPHONE
EAST 1291-1292
THORNTON HEATH 1331

AND 147 ST. JAMES ROAD, CROYDON.

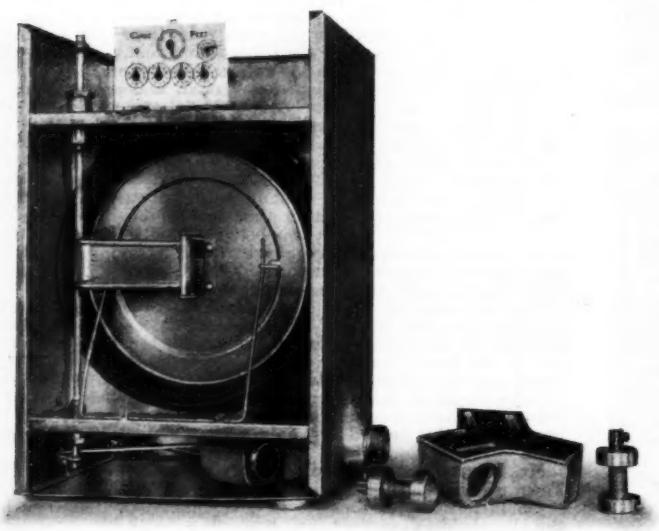
TELEGRAMS
METERISTIC, BIRMINGHAM
METERISTIC, CROYDON

SELF-DRAINING METER

(Manufactured under Licence)

The self-draining meter has been designed to meet the requirements of Districts where a wet gas is being distributed.

DIAPHRAGMS are mounted above the valves, therefore not in direct contact with liquor deposits.



VALVES in separate chamber are below diaphragms, therefore practically working in oil bath.

Construction of Valves is such that condensation collected in Diaphragm Chamber can drain through towards meter inlet.

MADE IN ALL CAPACITIES TO SUIT REQUIREMENTS

Gas Markets and Manufactures

Stock Market Report

(For Stock and Share Lists, see later pages)

With the exception of the result of the French General Election there was no change last week in the international political situation, but despite this markets kept steady though the volume of business became somewhat restricted. There was, however, a large demand by French nationals for British Funds, and under the lead of 2½% Consols these showed renewed strength and closed higher on the week. Another animated section was that of home rails, which received a fillip on the favourable decision on the rating question; L.N.E.R. 1st and 2nd and L.M.S. '23 preference stocks being outstanding features.

Gas stocks and shares were also well supported again, and prices remained very steady with few changes either way. On the London Exchange, Gas Light units hardened 3d. to 28s. 3d., which is only 9d. below the highest price recorded during 1935, and the 3½% maximum stock rose 1 to 91½. The announcement of the Imperial Continental Gas Association's final dividend of 6%, making 10% for the year (against 12%), caused no surprise, and after initial weakness the stock closed without change. Commercial ordinary dropped 1½ to 99½, giving a yield of just over 5%, and South Metropolitan 6% preference and 3% debenture both eased a point. In the Supplementary List, a feature was the rise of 5 points in Bognor 7% to 147½, and it will be seen that business in the Gas Light new 3½% debenture stock issued at par in April continues to be recorded at 4 premium. At the Provincial Exchanges, Chester ordinary was marked up 1½ to 111½, and South Shields closed 2½ points higher at 170.

A further two Corporation reports have been received during the week and both indicate a year of satisfactory progress. The South-Eastern Gas Corporation accounts to March 31 show a net profit of £93,052, against £87,015 for 1934-35, out of which it is proposed to pay a final ordinary dividend of 3%, making 6% for the year, the same rate as for the past two years. The carry-forward is increased from £10,080 to £16,631. The Corporation now has a controlling interest in 19 gas undertakings, and the investments in these subsidiaries stand at £2,852,027. The ordinary shares are quoted at 26s.-28s. *ex* div., and at the middle market price offer a yield of £4 9s.%. The second year's accounts of the South-Western Gas and Water Corporation, also to March 31, show a net profit of £21,343, against £12,859 for the period from Feb. 14, 1934, to March 31, 1935, during which time the Corporation was effecting the necessary acquisitions. The Directors are recommending a final dividend on the ordinary shares of 3%, making 5% for the year. The Corporation now owns 26 undertakings, the interest in which amounts to £602,596. The ordinary shares stand at 22s. 6d.-23s. 6d. *ex* div., giving a yield of £4 7s.%.

Current Sales of Gas Products

The London Market for Tar Products.

May 11.

The prices of tar products in the London market continue without change, at about the following levels:

Pitch, about 37s. 6d. per ton f.o.b.

Creosote, 5½d. per gallon.

Refined tar, 3¾d. per gallon in bulk at makers' works.

Pure toluole, about 2s. 7d.; pure benzole, 1s. 7d. to 1s. 8d.; 95/160 solvent naphtha, about 1s. 8d.; and 90/160 pyridine, about 4s. 3d. to 4s. 6d.—all per gallon naked at makers' works.

Tar Products in the Provinces.

May 11.

The average prices of gas-works products during the week were: Gas-works tar, 21s. to 26s. Pitch—East Coast, 36s. to 38s. 6d. f.o.b. West Coast—Manchester, Liverpool, Clyde, 36s. to 38s. 6d.* Toluole, naked, North, 2s. 2d. to 2s. 4d. Coal-tar crude naphtha, in bulk, North, 8d. to 8¼d. Solvent naphtha, naked, North, 1s. 6d. to 1s. 6½d. Heavy naphtha, North, 1s. 1d. to 1s. 2d. Creosote, *ex* works, in bulk, North, liquid and salty, 4⅝d. to 4⅞d.; low gravity, 4⅝d. to 4⅝d. Heavy oils, in bulk, North, 5d. to 5¼d. Carbolic acid 60's, 2s. 4d. to 2s. 6d. Naphthalene, £24 to £26. Salts, 100s. to 105s., bags included. Anthracene "A" quality, 3d. to 3½d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Correction.—Our Market Correspondent points out that the price he gave us for toluole, naked, North, in our issue of April 22 was 2s. 2d. to 2s. 4d. We regret that, owing to a printing error, the price *erroneously* appeared in the "JOURNAL" as 2s. 4d. to 2s. 6d.

Tar Products in Scotland.

GLASGOW, *May* 9.

Business continues difficult in most cases for want of prompt supplies. Quotations for the finer products are firm.

Crude gas-works tar.—The actual value is 34s. to 35s. per ton *ex* works in bulk.

Pitch remains comparatively uninteresting with quotations at 35s. to 37s. 6d. per ton f.o.b. Glasgow for export and 35s. per ton *ex* works in bulk for home trade.

Refined tar.—There is a fair volume of new business being placed for home trade at 3¾d. to 4d. per gallon *ex* works in buyers' packages, and 3d. to 3¼d. per gallon f.o.r. for export.

Creosote oil.—A steady demand continues and prices are unaltered. B.E.S.A. Specification, 5¼d. to 5⅜d. per gallon; low gravity, 5¼d. to 5½d. per gallon; neutral oil, 5¼d. to 5½d. per gallon; all *ex* works in bulk.

Cresylic acid.—With practically nothing available the following prices can only be taken as nominal. Pale, 97/99%, 1s. 9d. to 1s. 10d. per gallon; dark, 97/99%, 1s. 7d. to 1s. 8d. per gallon; pale, 99/100%, 2s. to 2s. 3d. per gallon; all *ex* works naked.

Crude naphtha.—Only small quantities are available and command 5¼d. to 5⅜d. per gallon, according to quality and district.

Solvent naphtha.—90/160 grade is 1s. 5½d. to 1s. 6½d. per gallon, and 90/190 heavy naphtha is 1s. 1d. to 1s. 2d. per gallon.

Motor benzole continues to be quoted in this district in small quantities at 1s. 3½d. to 1s. 4d. per gallon.

Pyridines.—90/160 grade is 5s. to 5s. 6d. per gallon, and 90/140 grade is 5s. 6d. to 6s. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.			
Crude benzole	0	8½	to	0	9	per gallon	at works	
Motor ,,	1	2	,,	1	2½	,,	,,	,,
90% ,,	1	3	,,	1	3½	,,	,,	,,
Pure ,,	1	7	,,	1	7½	,,	,,	,,

Contracts Advertised To-Day

Coal.

Barnoldswick Gas Department. [p. 420.]
Hebden Bridge and Mytholmroyd Gas Board. [p. 420.]
Sidmouth Gas Department. [p. 420.]
Sutton-in-Ashfield Urban District Council. [p. 419.]
Wallasey Gas Department. [p. 419.]

Fire Clay Goods.

Southport Gas Department. [p. 420.]

General Stores (Lead, Valves, Tools, Tin Plate Goods, &c.).

Southport Gas Department. [p. 420.]

Lighting Goods, Mantles, &c.

Southport Gas Department. [p. 420.]
Sutton-in-Ashfield Urban District Council. [p. 419.]

Meters.

Southport Gas Department. [p. 420.]

Oils.

Sutton-in-Ashfield Urban District Council. [p. 419.]

Oxide (New and Spent).

Rochdale Gas Department. [p. 420.]

Paint.

Southport Gas Department. [p. 420.]

Pipes, Tubes, &c.

Rochdale Gas Department. [p. 420.]
Southport Gas Department. [p. 420.]
Sutton-in-Ashfield Urban District Council. [p. 419.]

Retorts.

Sutton-in-Ashfield Urban District Council. [p. 419.]

Paint Firm's Successful Year

A successful year is reported by Messrs. Gittings & Hills, Ltd., Paint and Varnish Manufacturers, of Tower Works, Nechells, Birmingham—so successful that the present works of the firm, covering several acres, have become inadequate to house the growing activities of the business. A large factory adjoining the present works has accordingly been acquired and new buildings are in course of erection for housing cellulose and synthetic enamels production.

Gas and coke production with the best advantages of scientific control . . . .

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- GLOVER-WEST VERTICAL RETORTS
- WESTVERTICAL CARBONIZING CHAMBERS
- COAL AND COKE-HANDLING & PREPARATION

Glover-West verticals ordered in 1936 by—

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THE **KELSO** GAS COMPANY, LTD.
THE **ALTRINCHAM** GAS COMPANY (3RD ORDER)
THE **BILSTON** GAS LIGHT & COKE COMPANY (2ND ORDER)
THE **GRANGEMOUTH** CORPN. GAS DEPT. (2ND ORDER)
THE **JOHANNESBURG** MUNICIPAL GAS DEPT. (3RD ORDER)
THE **BALLYMENA** U.D.C. GAS DEPARTMENT (2ND ORDER)

THE SOCIETY OF BRITISH GAS INDUSTRIES · 1905 ·

WEST'S GAS IMPROVEMENT COMPANY, LTD.

MANCHESTER: ALBION IRONWORKS, MILES PLATTING
'Phone: COLLYHURST 2961 : 'Grams: "STOKER, MANCHESTER"

LONDON: COLUMBIA HOUSE, ALDWYCH, W.C. 2
'Phone: HOLBORN 4108 : 'Grams: "WESGASCO, ESTRAND, LONDON"

STOCK AND SHARE LIST

Official Quotations on the London Stock Exchange

Issue. £	Stock or Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations May 8.	Rise or Fall on Week.	Transactions, Lowest and Highest Prices During the Week.
1,767,439	Stk.	Mar. 16	7	7⅛	Alliance & Dublin Ord. ...	150—160	...	...
374,000	,,	Dec. 16	4	4	Do. 4 p.c. Deb. ...	95—100	...	...
557,655	,,	Feb. 17	7	7	Barnet Ord. 7 p.c.	167—172	...	169
300,000	1	Mar. 30	1/4½	1/9⅜	Bombay, Ltd.	1¼—1⅜	...	27/3
179,305	Stk.	Mar. 2	9½	9½	Bournemouth sliding scale ...	218—228	...	223
590,407	,,	,,	7	7	Do. 7 p.c. max. ...	170—175	+1	172
493,960	,,	,,	6	6	Do. 6 p.c. Pref. ...	148—153	...	150—151½
50,000	,,	Dec. 16	3	3	Do. 3 p.c. Deb. ...	85—90	...	...
262,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	105—110	...	109½—110
335,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	125—130	...	...
357,900	,,	Feb. 17	7½	7½	Brighton, &c., 6 p.c. Con. ...	170—175	...	...
649,955	,,	,,	6¾	6¾	Do. 5 p.c. Con. ...	155—160	...	158—159
205,500	,,	,,	6	6	Do. 6 p.c. 'B' Pref.	144—149	...	147½
855,000	,,	Mar. 2	7	8	British Ord.	158—163	...	161
100,000	,,	Dec. 16	7	7	Do. 7 p.c. Pref.	153—158	...	...
350,000	,,	,,	5⅛	5⅛	Do. 5⅛ p.c. 'B' Cum. Pref.	110—115	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	96—101	...	98—99
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	107—112	...	...
200,000	,,	,,	17/6§	3⅛	Do. 3½ p.c. Red. Deb. ...	98—100	...	...
100,000	10	22 May '33	6	4	Cape Town, Ltd.	1—3	...	...
100,000	10	6 Nov. '33	4½	4½	Do. 4½ p.c. Pref. ...	1—3	...	...
150,000	Stk.	Jan. 6	4½	4½	Do. 4½ p.c. Deb. ...	81—86	...	...
626,860	,,	Feb. 3	6	6	Cardiff Con. Ord.	130—135	...	...
237,860	,,	Dec. 16	5	5	Do. 5 p.c. Red. Deb.	110—115	...	...
98,936	1	Apl. 20	2/-	2/-	Colombo, Ltd., Ord.... ...	1⅜—1⅝*	...	...
24,500	1	,,	1/4½	1/4½	Do. 7 p.c. Pref....	20/—22/-	...	...
609,204	1	Mar. 30	-/11·48	-/11·48	Colonial Gas Assn. Ltd. Ord.	18 6—20 6	...	...
296,053	1	,,	1/3·30	1/3·30	Do. 8 p.c. Pref	22/6—24/6	...	...
1,775,005	Stk.	Feb. 3	5	5	Commercial Ord.	97—102	-1½	98—99
620,000	,,	Dec. 2	3	3	Do. 3 p.c. Deb. ...	85—90	...	86⅝—87
286,314	,,	Feb. 17	5	5	Do. 5 p.c. Deb. ...	120—125	...	122½
807,560	,,	,,	7	7	Croydon sliding scale ...	158—163	...	161⅝
644,590	,,	,,	5	5	Do. max. div.	114—119	...	...
620,385	,,	Dec. 16	5	5	Do. 5 p.c. Deb.... ...	121—126	...	124½
239,000	,,	Feb. 3	5	5	East Hull Ord. 5 p.c....	107—110	...	...
184,555	,,	Feb. 17	6	6	East Surrey Ord. 5 p.c. ...	130—135	...	...
176,211	,,	Dec. 16	5	5	Do. 5 p.c. Deb. ...	122—127	...	...
19,284,128	,,	Feb. 3	5⅜	5⅜	Gas Light & Coke 4 p.c. Ord.	27 9—28 9a	+/3	28 3—28 6
2,600,000	,,	,,	3⅜	3⅜	Do. 3⅜ p.c. max. ...	90—93	+1	91½—92
4,477,106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	105—108	...	106½—107¾
8,602,497	,,	Dec. 2	3	3	Do. 3 p.c. Con. Deb. ...	87—92	...	88—89½
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	117—120	...	118½—119
3,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	114—117	...	115½
270,466	,,	Feb. 17	6	6	Harrogate New Cons. ...	130—135	...	...
157,500	1	Mar. 16	1/7½	1/7½	Hongkong & China, Ltd. ...	1⅝—1⅞	...	...
213,200	Stk.	Mar. 2	6	6	Hornsey Con. 3½ p.c. ...	135—140	...	139
5,600,000	,,	Nov. 4	14	8	Imperial Continental Cap. ...	157—167	...	160—166½
223,130	,,	Jan. 20	3½	3½	Do. 3½ p.c. Red. Debs.	92—97	...	95—96
285,242	,,	Feb. 17	8⅝	8⅝	Lea Bridge 5 p.c. Ord. ...	175—180	...	177—178½
165,736	,,	Mar. 16	8	10	Maidstone 5 p.c. Cap. ...	180—190	...	...
63,480	,,	Dec. 16	3	3	Do. 3 p.c. Deb. ...	80—85	...	...
75,000	,,	Dec. 2	110	110	Malta & Mediterranean ...	200—210	...	...
392,000	—	Apl. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	102—107	...	...
231,978	Stk.	Feb. 17	5	5	M.S. Utility 'C' Cons. ...	110—115	...	...
818,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	102—107	...	...
360,075	,,	Dec. 16	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
148,955	,,	,,	5	15	Do. 5 p.c. Deb. ...	123—128	...	...
125,000	—	Jan. 2	3½	3½	Do. 3½ p.c. Rd. Rg. Bds.	96 - 99	...	...
675,000	Stk.	Nov. 18	†3	†3	Montevideo, Ltd.	67—72	...	68
225,000	,,	Feb. 17	7½	7½	North Middlesex 6 p.c. Con.	169—174	...	...
396,160	,,	Feb. 3	5	5	Northampton 5 p.c. max. ...	108—113	...	110
300,000	,,	Apl 20	19	17	Oriental, Ltd....	165—170	...	...
416,617	,,	Dec. 16	8	8	Plymouth & Stonehouse 5 p.c.	166—171	...	...
504,416	,,	Feb. 3	8¼	8¼	Portsmouth & Gosport Cons.	170—175	...	...
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	108—113	...	...
114,000	,,	Feb. 3	5	5	Preston 5 p.c. Pref.	110—115	...	...
355,698	1	Apl. 20	1/-	1/-	Severn Va'. Gas Cor. Ld. Ord.	20 6—22 6	...	22/11—22/6
454,510	1	Mar. 16	-/10½	-/10½	,, ,, 4½ p.c. Cum. Pref.	21/—23 -	...	22 3—22/6
133,201	Stk.	Feb. 17	8½	5	Shrewsbury 5 p.c. Ord. ...	147—152	...	...
90,000	10	27 May '35	†3	†3½	South African... ...	3¼—4¼	...	...
1,106,173	1	May 4	1 2/-	1 2/-	South East'n Gas Cn. Ld. Ord.	26/—28 -*	—/6	26 7½—27/6
845,511	1	Mar. 16	-/10½	-/10½	Do. 4½ p.c. Red. Cum. Pref.	21/—23 -	...	22/—22 3
200,000	1	,,	4	4	Do. 4 p.c. Cum. Pref. ...	20 9—21/9	...	...
450,000	Stk.	Feb. 17	4	4	Do. 4 p.c. Red Deb. ...	101—104	...	...
6,709,895	,,	Feb. 3	5	6½	South Met. Ord.	124—127	...	124—126
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf....	145—150	—1	146—146½
850,000	,,	,,	4	4	Do. 4 p.c. Irred. Pf....	104—107	...	105½—106
1,895,445	,,	Dec. 16	3	3	Do. 3 p.c. Deb. ...	88—91	—1	88
1,000,000	,,	Jan. 6	5	5	Do. 5 p.c. Red. Deb.	114—117	...	...
1,543,795	,,	Feb. 3	6	6	South Suburban Ord. 5 p.c....	131—136	...	133½—134½
512,825	,,	,,	5	5	Do. 5 p.c. Pref....	122—127	...	124½
500,000	,,	,,	4	4	Do. 4 p.c. Pref....	103—108	...	105
888,587	,,	Dec. 16	5	5	Do. 5 p.c. Deb....	123—128	...	125
250,000	,,	,,	4	4	Do. 4 p.c. Deb....	104—109	...	...
427,859	1	May 4	9½	1 2½	S. Western Gas & Water Ord.	22 6—23/6*	—/6	22 9
160,523	1	Apl. 20	...	-/10½	Do. 4½% Red. Cum. Pref.	21/9—22 9	...	...
110,000	Stk.	Dec. 16	4	4	Do. 4% Red. Deb. ...	98—103	...	...
647,740	,,	Feb. 3	5	5	Southampt'n Ord 5 p.c. max.	113—118	...	...
121,275	,,	Dec. 16	4	4	Do. 4 p.c. Deb.	98—103	...	...
350,000	,,	Feb. 3	5½	5½	Swansea 5½ p.c. Red. Pref. ...	111—116	...	...
106,000	,,	Dec. 16	6½	6½	Do. 6½ p.c. Red. Deb. ...	96—101	...	100
94,000	,,	...	...	...	Do. 3½ p.c. Red. Deb. ...	96—101	...	...
1,076,490	,,	Feb. 17	6½	6½	Tottenham and District Ord.	149—154	...	...
409,835	,,	,,	5½	5½	Do. 5½ p.c. Pref....	130—135	...	...
62,235	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	...
371,850	,,	Dec. 2	4	4	Do. 4 p.c. Deb. ...	103—108	...	106
369,774	,,	Feb. 3	7	7	Uxbridge, &c., 5 p.c. ...	153—158	...	155
108,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	...
1,340,521	,,	Feb. 3	7	7	Wandsworth Consolidated ...	158—163	...	160—162½
1,371,373	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	...
1,317,964	,,	Dec. 16	5	5	Do. 5 p.c. Deb. ...	123—128	...	124½
338,300	,,	,,	4	4	Do. 4 p.c. Deb. ...	104—109	...	...
499,735	,,	Feb. 17	6½	7½	Watford and St. Albans Ord.	155—160	...	...
200,000	,,	,,	5	5	Do. 5 p.c. Pref. ...	120—125	...	...
200,000	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	133—138	...	...
200,000	,,	Dec. 2	4	4	Do. 4 p.c. Red. Deb.	100—105	...	...
100,000	,,	...	...	3½	Do. 3½ p.c. Red. Deb.	96—101	...	...
158,400	,,	Mar. 2	5	6b	Winchester W. & G. 5 p.c. Con.	115—120	...	...

a.—The quotation is per £1 of Stock. b.—Paid £3, including 10s. on account of back dividends. * Ex div.
† Paid free of income-tax. ‡ For year. § Actual for three months.

Stock and Share List continued overleaf.

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STOCK AND SHARE LIST—Cont.

Stocks Officially Quoted on Provincial Exchanges

Issue. £	Stock or Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations. May 8.	Rise or Fall on Week.	Transactions, Lowest and Highest During the Week.
BRISTOL EXCHANGE.								
347,756	Stk.	Feb. 3	5	6	Bath Cons.	124—126	...	...
1,667,250	,,	Feb. 17	5	5	Bristol, 5 p.c. max.	120—122	...	...
120,420	,,	Dec. 16	4	4	Do. 1st 4 p.c. Deb. ...	103—105	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	103—105	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	125—128	...	...
274,000	,,	Feb. 17	5	5	Newport (Mon.) 5 p.c. max....	111—116	...	...
13,200	12	Mar. 16	7	8½	Pontyp'l Gas & W. 10 p.c. 'A.'	14—15	...	...
13,600	10	,,	5	6	Do. 7 p.c. B.'	11½—12	...	...
40,000	10	,,	5	6	Do. 7 p.c. 'C.'	11½—12	...	...
140,778	Stk.	Feb. 17	5	5	Weston-super-Mare Cons. ...	113—115	...	...
64,338	,,	Dec. 16	4	4	Do. 4 p.c. Deb.	98—100	...	...
33,340	,,	,,	7½	7½	Do. 7½ p.c. Deb.	165—169	...	...
LIVERPOOL EXCHANGE.								
157,150	Stk.	Feb 3	5	6½	Chester 5 p.c. Ord.	109—114	+1½	112½
92,500	,,	Dec. 16	4	4	Do. 4 p.c. Pref.	100—105	...	...
32,540	,,	,,	3½	3½	Do. 3½ p.c. Deb. ...	91—96	...	...
41,890	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	100—105	...	...
2,167,410	,,	Feb. 17	6	6	Liverpool 5 p.c. Ord. ...	135—137	...	...
245,300	,,	Dec. 16	5	5	Do. 5 p.c. Red. Pref. ...	103—108	...	...
306,083	,,	Jan. 6	4	4	Do. 4 p.c. Deb. ...	105—107	...	...
106,280	,,	Feb. 3	10	10	Preston 'A' 10 p.c. ...	202—212	...	...
188,219	,,	,,	7	7	Do. 'B' 7 p.c.	140—153	...	...
NEWCASTLE EXCHANGE.								
122,577	Stk.	Mar. 2	8	8	Blyth 5 p.c. Ord.	154—156	...	...
732,000	,,	Feb. 3	5	5	Hartlepool G. & W. Co. & New	117—119	...	...
2,061,315	,,	Feb. 3	5	5½	Newcastle & Gateshead Con.	25 9—26 3*a*	...	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	106½—107½	...	...
776,706	,,	Dec. 16	3½	3½	Do. 3½ p.c. Deb. ...	100½—101½	...	...
277,285	,,	May 4	5	5	Do. 5 p.c. Deb. '43...	103—104*	−2	...
209,820	,,	Mar. 2	8½	8½	South Shields Con.	169—171	+2½	...
299,542	,,	Feb. 3	6	6	Sunderland 6 p.c. max. ...	129—131	...	...
NOTTINGHAM EXCHANGE.								
542,270	Stk.	Feb. 17	7	10	Derby Con.	176—186	...	...
55,000	,,	Dec. 16	4	4	Do. 4 p.c. Deb.	100—105	...	...
84,750	,,	Feb. 17	5	12	Long Eaton 'A' Ord. ...	175—185	...	...
50,000	,,	,,	4	10	Do. 'B' Ord. ...	130—140	...	...
20,000	10	Dec 16	5	5	Do. 5 p.c. Pref. ...	10—12	...	...
80,000	Stk.	,,	5	5	Do. 5 p.c. Deb. ...	117—122	...	...
SHEFFIELD EXCHANGE.								
10,000	Stk.	Feb. 17	10	10	Great Grimsby 'A' Ord. ...	220—230	...	...
6,500	,,	,,	10	10	Do. B' Ord. ...	220—230	...	...
79,000	,,	,,	10	10	Do. 'C' Ord. ...	205—215	...	...
1,806,339	,,	Feb. 17	6	6	Sheffield Cons.	147—150	...	...
95,000	,,	Dec. 16	4	4	Do. 4 p.c. Deb.... ...	100½—102½	...	...

a The quotation is per £1 of Stock.

Supplementary List of Stocks and Shares not Officially Quoted

202,152	Stk.	...	...	...	Ascot Ord.	119—124	...	...
128,182	,,	...	...	...	Do. 5 p.c. Pref.	117—122	...	...
238,631	1	Nov. 4	5	5	Assd. Gas and Water Ord....	21/—23/-	...	22/6—22/9
323,681	1	,,	4½	4½	Do. 4½ p.c. Cum. Pref. ...	22/—23/-	...	22/-
150,000	Stk.	...	...	...	Do. 3½ p.c. Red. Deb. ...	...	...	100½—101
17,000	,,	Feb. 17	8	8	Bognor Orig. Ord. 'A' ...	175—185	...	...
62,210	,,	,,	8	8	Do. New Addl. 'A' ...	172—185	...	...
87,160	,,	,,	7	7	Do. New 7 p.c. max. ...	145—150	+5	148½—150
37,440	,,	Feb. 3	10	10	Cam.Univ. & Town 10 p.c.max.	210—220	...	...
125,970	,,	,,	7	7	Do. 7 p.c. max.	158—163	...	...
39,025	,,	,,	5	5	Do. 5 p.c. max.	108—113	...	...
65,000	,,	Mar. 2	7½	8½	Eastbourne 'A' 5 p.c. ...	160—165	...	...
198,000	,,	,,	6	7	Do. 'B' 3½ p.c.	133—138	...	...
112,312	,,	,,	5	5	Do. 5 p.c. Pref.	120—125	...	...
130,000	,,	Dec. 16	5	5	Do. 5 p.c. Deb.	122—127	...	...
250,000	1	Nov. 18	...	4	Gas Consolidation Ord. ...	20 6—22/6	...	...
250,000	1	,,	...	4	Do. 4 p.c. Red. Cum. Pref.	19 6—20/6	...	19/9—19/10½
700,000	Stk.	...	...	...	Gas Light & Coke 3½ p.c. Rd. Db	102—104	...	103½—104
24,000	30	Feb. 3	8½	8½	Great Yarmouth 8½ p.c. max.	52—57	...	...
59,400	30	,,	7½	7½	Do. 7½ p.c. max.... ...	42—45	...	...
51,160	Stk.	Dec. 2	5½	5½	Do. 5½ p.c. Deb.... ...	123—128	...	...
152,600	,,	Mar. 2	8	8	Guildford Cons.	185—195	...	...
54,055	,,	,,	5	5	Do. 5 p.c. Pref.	114—119	...	...
68,250	,,	Dec. 16	5	5	Do. 5 p.c. Deb.	120—125	...	...
156,600	,,	Feb. 3	7½	7½	Hampton Court Cons. ...	167—177	...	...
81,660	10	Feb 4,'35	5	9	Leatherhead Ord.	16—17	...	...
107,960	10	Mar. 16	4	5½	Mid Kent Ord.	10—11	...	...
230,940	Stk.	Feb. 17	10	10	Oxford & District Ord. ...	205—215	...	...
47,112	,,	,,	5	5	Do. 5 p.c. Pref.	118—123	...	...
50,000	,,	,,	6	6	Do. 6 p.c. Red. Pref. ...	113—118	...	...
126,193	,,	Nov. 18	7½	7½	Peterborough Ord.	160—170	...	...
64,990	,,	Mar. 16	7½	7½	Redditch Ord.	113—118	...	...
166,850	,,	Feb. 17	7	9	Romford Ord.	170—180	...	...
60,000	,,	,,	4	4	Do. 4 p.c. Pref.	97—100	...	...
44,000	,,	Mar. 16	5	5	Do. 5 p.c. Deb.	120—125	...	...
10,950	,,	Mar. 2	8	8	Ryde Ord.	165—170	...	...
136,191	,,	Feb. 3	5	7	Scarborough Ord.	128—138	...	...
27,825	,,	Feb. 3	8	8	Shanklin & Ventnor Cons. ...	152—162	...	...
40,643	,,	Mar. 2	7	7	Slough Ord.	147—152	...	...
221,000	,,	Dec. 16	5	5	Do. 5 p.c. Deb.	116—121	...	...
28,872	1	May 4	5½	5½	S. Midland Gas Cpn.Ltd. Ord.	20/—22/-*	...	...
28,866	1	Mar. 16	4½	4½	Do. 4½ p.c. Red. Cum Pref.	19 6—21/6	...	...
137,730	Stk.	Feb. 17	7	7	Southgate & Dist. 7 p.c. max.	148—153	...	...
62,500	,,	,,	5	5	Do. 5 p.c. Pref.	115—120	...	...
117,228	,,	Mar. 2	5	6	Swindon Cons.	111—116	...	...
60,425	,,	Dec. 16	5	5	Do. 5 p.c. Deb.	122—127	...	...
50,000	1	Mar. 30	...	5·52d.	*a* Utd. Kingdom Gas Cpn. Ord.	20/6—22/6	...	20/10½—21/3
760,910	1	,,	2½	2½	Do. 4½ p.c. Prefd. Ord....	20/—22/-	...	...
110,910	1	,,	...	2½	Do. 4½ p.c. Cum. Pref. ...	21 -—23/-	...	...
900,000	Srk.	Mar. 16	...	3½	Do. 3½ p.c. Red. Deb. ..	98—101	...	...
130,000	,,	Feb. 3	5	8	Wakefield Ord.	140—145	...	...
81,650	,,	,,	5	5	Do. 5 p.c. max.	105—110	...	...
500,000	,,	...	...	...	Wandsworth 4 p.c. Pref. ...	104½—106½	...	105¾
82,000	,,	Feb. 3	6	6	Weymouth Ord.	106—111	...	...
98,384	,,	Feb. 3	6	6	Wolverhampton 6 p.c. Pref.	127—132	...	...
160,000	,,	Dec. 16	5½	5½	Do. 5½ p.c. Rd. Db	107—112	...	...
370,000	,,	Feb. 3	4	6	York Cons.	108—113	...	111½
90,000	,,	Dec. 16	5	5	Do. 5 p.c. Red. Deb. ...	103—108	...	...
133,640	,,	Feb. 3	6½	6½	Yorktown (Cam.) 5 p.c. Cons.	127—132	...	...
120,000	,,	,,	5	5	Do. 5 p.c. Pref.	115—120	...	...
35,000	,,	Dec. 16	5½	5½	Do. 5½ p.c. Deb.... ...	130—135	...	...

a Actual.

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